

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Ec 7ag2
cap1

Agricultural Economics RESEARCH



CONTENTS FOR OCTOBER 1955

Vol. VII, No. 4

	Page
Government Financing of Farm Exports in the Postwar Period <i>Doris Detre Rafler</i>	91
The Marketing Bill for Agricultural Products <i>Kenneth E. Ogren</i>	101
A Foundation for Objective Forecasts of Cotton Yields <i>Walter A. Hendricks and Harold F. Huddleston</i>	108
Book Reviews <i>Don Paarlberg, B. Ralph Stauber, Kenneth W. Meinken, Harry C. Trelogan, John O. Gerald, Charles E. Rogers</i>	112

UNITED STATES DEPARTMENT OF AGRICULTURE

Agricultural Marketing Service
Agricultural Research Service

Contributors

DORIS DETRE RAFLER, of the Agricultural Economics Division, Agricultural Marketing Service, is responsible for the analysis of factors affecting the foreign demand for agricultural commodities. She has written extensively on international trade and financial developments and their influence on United States farm exports.

KENNETH E. OGREN is the Head of the Marketing Information and Statistics Section, Marketing Research Division, AMS.

WALTER A. HENDRICKS, who reported some results from studies on estimating corn yields in our July issue, here collaborates with H. F. Huddleston of his staff on preliminary findings from work on forecasting yields of cotton.

HAROLD F. HUDDLESTON, concerned with research studies on crop-yield forecasting in the Agricultural Estimates Division, joins with Mr. Hendricks in reporting on some of the 1954 cotton work.

DON PAARLBERG is Assistant to the Secretary of Agriculture. He entered the Department in 1953 from the Department of Agricultural Economics at Purdue University. He is secretary to the National Agricultural Advisory Commission.

B. RALPH STAUBER, Chief of the Agricultural Price Statistics Branch, AMS, is chairman of the Departmental Committee for Mathematics and Statistics and of the Committee on Internships in Sampling in the Graduate School of the United States Department of Agriculture. He has taught the course in Principles of Statistical Analysis in the Graduate School since 1931.

KENNETH W. MEINKEN, formerly with AMS, is Assistant Professor of Agricultural Economics at Rutgers University. He is the author of a technical bulletin, now in press, on the demand and price structure for wheat that includes a system of six equations fitted by the relatively new simultaneous equations technique.

HARRY C. TRELOGAN is Director of the Marketing Research Division, AMS.

JOHN O. GERALD, in the Marketing Research Division of AMS, is currently engaged in study of the establishment of egg prices in central markets, including the role of commodity exchanges and the futures market in the establishment of spot prices.

CHARLES E. ROGERS, one of the editors of this journal, was formerly Educational Relations Officer of the Food and Agriculture Organization of the United Nations (FAO).

EDITORS: CHARLES E. ROGERS
JAMES P. CAVIN

ASSISTANT EDITORS: RAYMOND P. CHRISTENSEN
WINN FINNER

AGRICULTURAL ECONOMICS RESEARCH

A Journal of Economic and Statistical Research in the
United States Department of Agriculture and Cooperating Agencies

Volume VII

October 1955

Number 4

Government Financing of Farm Exports in the Postwar Period

By Doris Detre Rafler

The extent to which farm exports have received assistance from the United States Government is a subject of continuing interest and controversy. Relative data on a current basis are published in the Demand and Price Situation. This article presents a comprehensive estimate and analysis of Government financing during the post-World War II period. It also discusses the relationship of Government financed exports to total agricultural exports, to the gross foreign expenditures of the United States, and to overall measures of surplus disposal.

THE UNITED STATES Government made \$40 billion available as foreign economic aid during the years following the end of World War II. Of this amount more than \$13 billion was used to finance agricultural exports.

Most of this aid was on a grant basis. From July 1, 1945, through December 31, 1954, non-military grants by the United States to foreign countries totaled \$28 billion. Nearly 40 percent of these grants financed the procurement in this country of agricultural commodities. The total export value of farm products under grant programs may be estimated at approximately \$11 billion.

In addition to these grants, postwar United States Government loans and credits totaled nearly \$12 billion. Of this amount, approximately \$1.3 billion was extended for the purpose of financing the export of United States farm commodities, and another estimated \$1 billion was in fact used to buy United States agricultural products.

There is valid and recurrent interest in the extent to which the United States Government has assisted farm exports. Calculations comparing total agricultural exports with those directly authorized under U. S. grants and loans have been used in discussion and testimony relating to foreign aid and agricultural surplus-disposal legislation. The main purpose of this paper is to present

in a comprehensive form statistics relating to the nature and magnitude of Government assistance to farm exports and to point out the conceptual and statistical problems involved in such a compilation. In addition, it will be shown that data on Government financed exports have been subject to misinterpretation which arose from four major causes:

(1) It cannot be assumed that without Government financing directly tied to agricultural commodities, the volume of farm exports would have been smaller by the amount of exports so financed.

(2) The value of Government financed exports at times overstates and at other times understates the cost to the United States Treasury of such exports.

(3) Estimates of Government financed exports in many instances do not correspond with recorded exports as published by the Bureau of the Census.

(4) Government financed exports have not in recent years measured the extent of "noncommercial" exports.

Each of these points is discussed in this article.

Nature of Government Assistance

In measuring the role of this Government in agricultural exports two series of data have gained currency. The first includes only commodities

TABLE 1.—Government grants, United States, July 1, 1945–Dec. 31, 1954

Program	Total grants ¹	Agricultural exports financed ²
	<i>Million dollars</i>	<i>Million dollars</i>
1. Lend Lease (postwar pipeline)-----	1, 227	691
2. UNRRA, post-UNRRA and interim aid-----	3, 443	1, 628
3. Marshall Plan, Mutual Security and other economic and technical assistance-----	³ 16, 189	³ 5, 346
4. Civilian supply-----	5, 821	3, 290
5. Department of Agriculture donations-----	148	148
6. Other ⁴ -----	1, 299	(⁵)
Total-----	28, 127	11, 103

¹ Total grants, less military aid. Data cover all program costs including ocean transport, except that item 3 includes freight subsidies on relief parcels shown in item 5.

² Data are on an f. a. s. basis. Including ocean transport, the total for all programs may be estimated at \$12 billion.

³ Including \$38 million proceeds of foreign currency sales made available as grant aid, but not including \$190 million in such proceeds unallocated as of Dec. 31, 1954.

⁴ Includes grants for Philippine rehabilitation, Chinese stabilization, foot and mouth disease eradication, contributions to international programs other than UNRRA, etc.

⁵ Not available.

Department of Commerce, Office of Business Economics "Foreign Grants and Credits" (December 1954 quarter); USDA, Statistical Bulletin No. 112, (p. 19, table 17); Records of the Department of Defense, and the Foreign Operations Administration and predecessor agencies.

that move under United States grant aid, and is usually referred to as "Aid Financed Exports".¹ In the aggregate, most of the postwar United States aid to foreign countries was in the form of grants, hence the bulk of agricultural exports financed by the Government received this type of assistance. A comparison of agricultural exports financed by grants with all grant programs is contained in table 1.

Need for grant aid stemmed from the insufficient earning power of foreign countries, the consequent shortage of foreign exchange, and the inconvertibility of most currencies. These same factors were the basis for most of the postwar United States loans and credits, and the more recently adopted programs of the sale of surplus commodities for foreign currencies (most of the proceeds of which have thus far been extended in the form of grants and loans). The other series of data currently published, and referred to as "Government Financed Exports," includes in addition to grant aid, commodities moving under Government loans and credits and sales for for-

eign currencies.² Care should be observed in the use of these terms, especially because of the declining importance of direct grant aid; in 1954–55, for instance, "aid-financed" exports equaled 12 percent and "government-financed" exports 26 percent of total farm exports.

Throughout this paper Government financed exports are defined as those that move under grants, gifts, loans, and credits, or are sold for foreign currencies. The value of the commodities moving under these programs can be related in magnitude both to statistics on the international financial transactions of the United States, and to official trade statistics.

Under this definition, certain other forms of Government export assistance have been omitted, although they result in a drain on the U. S. Treasury and may be significant for other types of analyses. One such item omitted is export subsidies. Part of the United States customs receipts have been used to make payments to exporters covering up to 50 percent of the cost of certain commodities. These payments were designed as

¹ UNITED STATES DEPARTMENT OF AGRICULTURE, FOREIGN AGRICULTURAL SERVICE, "Foreign Agricultural Trade," December 1954.

² UNITED STATES DEPARTMENT OF AGRICULTURE, AGRICULTURAL MARKETING SERVICE, "Demand and Price Situation," February 1955.

assistance to exports that otherwise would not have taken place.³ Direct subsidies from special appropriations, are also paid on exports under the International Wheat Agreement.⁴

These direct subsidies are not included in this calculation of Government financed exports because (1) to a large extent they were paid on commodities already included under foreign aid and other programs;⁵ (2) the amount of these payments has been excluded from official trade statistics since January 1, 1950; (3) payments under the Wheat Agreement were made as a matter of international obligation even at a time when large quantities of wheat moved at full price.

The other main exclusion from calculations of Government financed exports are the losses incurred by the Commodity Credit Corporation in the export of commodities owned or controlled by it.⁶ Export dispositions at a loss—that is under CCC cost—including both sales for dollars and foreign currencies cover a large part of current price-support stocks, with some cotton recently included. It seems fairly obvious that whenever the CCC export price is well below domestic market prices, the Government plays the major role in the export of such commodities.⁷ During the last 3 years the aggregate loss to CCC on export operations exceeded all forms of direct subsidization.

³ Such payments were provided for in Section 32 of the Act of August 24, 1935, as amended. (PL 320, 74th Congress).

⁴ The International Wheat Agreement Act, as amended (PL 421, 81st Congress, extended by PL 180, 83rd Congress).

⁵ Government financed cotton exports in 1945/46, for instance, equaled 60 percent of total exports, but inclusion of quantities moving under subsidies would have resulted in a figure of more than 100 percent. ("The Cotton Situation" May 27, 1955.) Similar duplication, which affects comparability with trade statistics, is the main reason for excluding subsidies from data on Government financing.

⁶ The authority for such export sales by CCC is contained in the Commodity Credit Corporation Charter Act, as amended (PL 806, 80th Congress) and in the Agricultural Act of 1949, as amended (PL 439, 81st Congress).

⁷ Thus it may be estimated that in 1953-54, 35 percent or \$163 million of wheat and flour exports was "Government financed." Actually all of the \$450 million of wheat and flour exports were subject to Government export programs involving direct (IWA) and indirect (CCC) subsidization.

These losses are not included in the attached calculations of Government financed exports for the following reasons: (1) They are incurred largely on commodities already included in the calculations under other programs; (2) they are not reflected in the trade statistics; (3) they are perhaps best regarded as part of the cost of the price-support program, rather than as a charge against export assistance and foreign aid.⁸

Dependence of Exports on Government Financing

In the early postwar period, July 1, 1945-March 31, 1948, many foreign countries were recovering slowly from the devastation of the war and import demands were unusually high. Foreign countries as a whole were able to meet, from their own resources, only 60 percent of their dollar requirements for imports of goods and services from the United States. In the case of Western Europe and its dependencies, 40 percent of total dollar requirements were met from current earnings, and 20 percent by the sale of gold and United States securities. The remaining 40 percent of foreign dollar requirements were met through United States grants and loans, and the proportion of such financing for agricultural commodities is estimated at more than half the total imports from this country.

The reason for the relatively high proportion of Government financing for agricultural commodities lay in the nature of the United States aid programs.⁹ The UNRRA, post-UNRRA, interim aid, and civilian supply programs were essentially relief operations designed to fill urgent requirements in countries whose resources were most impaired by the war. When human needs are measured on a minimum basis, food occupies a preponderant position. Although UNRRA was

⁸ In the case of foreign-currency sales under Title I of the Agricultural Trade Development and Assistance Act of 1954, the Act provides for reimbursal of CCC by appropriation of all costs in excess of receipts.

⁹ For a description of the aid programs discussed in this paper see U. S. DEPARTMENT OF COMMERCE, OFFICE OF BUSINESS ECONOMICS, "Foreign Aid by the United States Government 1940-51" (Washington, 1952) and "Foreign Grants and Credits by the United States Government" (Washington, issued quarterly).

in fact an international program, the United States met 72 percent of the total cost of its operation. Many of the other contributing countries, such as the United Kingdom, were themselves in a deficit position with respect to food. Thus shipments of food devolved largely upon the U.S.¹⁰

When the European Recovery Program was instituted, the basic relief needs of many European countries were still critical. Agricultural recovery had been impeded by the severe winter of 1946-47 and by drought. In their trade with the United States in 1947, the Marshall Plan countries and their dependencies could finance only 29 percent of their imports from export earnings.¹¹ The success of reconstruction was predicated on continued shipment of food, because adequate food was deemed essential for the human energy and determination necessary to revive Europe's lagging economy.

As a result, relief-type shipments constituted about two-thirds of the initial phase of the Marshall Plan.¹² The concurrent distribution of civilian supplies by the military, originally designed merely to prevent "disease and unrest," was now directed toward the same purpose. In the case of aid to China, authorized at about the same time, large quantities of food and cotton were programmed in an effort to combat inflation. Without aid financing for these urgent needs, foreign countries probably would have reduced greatly nonagricultural imports from the U. S.

As production in European countries began to recover, their import programs contained a much higher percentage of recovery-type items, such as industrial raw materials and machinery. Furthermore, as their export earnings increased, they could have met all their requirements for United States agricultural commodities with "earned" dollars, and financed the shipment of other raw materials, machinery, and manufactures with

"aid" dollars. The reason why a relatively high proportion of aid funds continued to finance agricultural export was in part an administrative matter. The procurement of bulk commodities such as wheat and cotton, involving relatively few variations in grade, made specifications simpler, shipments more rapid, and generally eased the red tape connected with administration of the aid programs.

It is not logical to assume, however, that United States farm exports depended on foreign aid disbursements during this period. Most countries did not import more farm products than were urgently needed for immediate consumption. Had foreign countries used "earned" dollars to buy our farm commodities the volume of such exports might have remained about the same, while exports of nonagricultural commodities would have appeared to rely in a large measure on aid financing.¹³

With the inception of the programs within the Mutual Security Program, which called for sale of surplus commodities for foreign currencies,¹⁴ the receipt of a certain part of United States foreign aid funds by foreign countries became directly tied to the export of United States farm products.¹⁵ There is no indication, however, that farm exports under these programs were additional to the normal requirements of the importing countries.¹⁶ Had they received dollars, they might have bought substantially the same commodities, though not necessarily at the same time, or even from the United States. Thus part of

¹⁰ WOODBRIDGE, GEORGE, UNRRA. (New York, Columbia University Press, 1950) Vol. I, p. 383.

¹¹ In his presentation to Congress, Secretary of State George C. Marshall estimated that during 1948-49 Western Europe's exports would finance a third of their import requirements from the Western Hemisphere (Testimony before the Senate Committee on Foreign Relations, January 8, 1948).

¹² Hearings before the Committee on Foreign Relations, U. S. Senate, January 8-15, 1948.

¹³ In some years the domestic economy could have absorbed larger quantities of farm products than were available to it. Without allocation for export, made necessary by the aid programs, exports would have been smaller. But this is not the situation referred to by those who seek to establish the dependence of farm exports on aid financing.

¹⁴ Section 550 of the Mutual Security Act of 1953 and Section 402 of the Mutual Security Act of 1954. Sales for foreign currencies are also made under authority of the Commodity Credit Corporation Charter Act (PL 806, 80th Congress) and the Agricultural Trade Development and Assistance Act of 1954, Title I (PL 480, 83rd Congress).

¹⁵ In some instances countries received aid in the form of currencies of third countries which bought the farm products.

¹⁶ In fact, the legislation provided safeguards against interference with the trade of friendly countries.

these exports, but only an indeterminate part, was directly dependent upon aid programs.

Since during most of the postwar period foreign countries exercised a choice in whether to use their "earned" dollars for agricultural commodities or for other imports from the United States, the use of data on actual exports financed through grants as a measure of dependence on such grants may be questionable. All that can be said is that, as a result of grant aid, total United States exports to the recipient countries may have been increased; or alternately, without such aid, our exports might have been about the same but reserve accumulations and debt repayment would have been smaller.

On the other hand, United States aid may also have increased exports to countries that were not direct recipients. Part of the United States aid was spent in countries such as Canada and Cuba for offshore procurement, thus in turn increasing their ability to buy U. S. farm products.¹⁷ In addition United States aid made it possible for recipient countries to divert their own resources to imports from other dollar countries. The resultant dollar earnings of these "third areas" eventually were used to import United States commodities and to finance other transactions with the United States or to strengthen their reserve position. This "triangular" effect of the aid programs on farm exports was not insignificant. Military aid funds spent on offshore procurement also increased the import potential of foreign countries for United States farm commodities.

Importance of Loans and Credits

Between July 1, 1945, and the end of 1954 loans and credits designed to finance the procurement of United States agricultural commodities amounted to an estimated \$1.3 billion.

During the first 3 postwar years, in order to help reestablish textile production and trade, the United States Department of Agriculture exported on a credit basis large quantities of cotton to Japan for processing. These credits were re-

paid from the proceeds of Japanese textile exports. Germany, too, received and repaid this type of credit aid. Similar activity with respect to Japan was carried out in later years through the "Natural-Fibers Revolving Fund" which Congress created for this purpose. Total credits utilized under these two programs amounted to nearly \$270 million.

Export-Import Bank loans, mainly for cotton, amounted to an estimated \$800 million. Additional Government loans to India (grain), Pakistan and Afghanistan (wheat), and Spain (wheat and cotton) amounted to \$218 million.

Thus, in total, dollar loans and credits granted to assist farm exports reached an estimated \$1.3 billion. In addition, some part of the residual \$10.6 billion in postwar loans and credits extended by the United States undoubtedly assisted farm exports. One example is the loan of \$3,750 million to the United Kingdom. The use of the proceeds of this loan was not predetermined, either as to commodities which would be bought or as to the country where purchases were to be made. Drawings on this loan began in the third quarter of 1946, and by August 15, 1947, they totaled \$3 billion. Approximately a third of this amount had been used to procure food and tobacco in the United States.¹⁸

As total agricultural exports in 1946-47 amounted to \$3.6 billion, a not inconsiderable portion of such exports benefited from the loan to Britain. Even when the proceeds of the loans were not used for agricultural commodities (Export-Import Bank loans of this type totaled more than \$3 billion), the countries that received these loans were able to devote a larger—but unspecified—part of their other dollar resources to the purchase of United States farm commodities. Furthermore, the indirect effect of the loans in stimulating purchases of "third areas" would be the same as for grants.

¹⁷ Payments of ECA dollars to Canada and Latin American countries for goods bought from them by participating countries was the source of funds for 16 and 9 percent, respectively, of their 1949 expenditures in the U. S. (ECA, Seventh Report to Congress, p. 60).

¹⁸ Hearings before the Committee on Appropriations, U. S. Senate, May 13-June 10, 1948. See also House of Commons Debate on August 7, 1947, which indicates that direct United Kingdom expenditures in the U. S. for food and tobacco in fiscal year 1946/47 totaled approximately \$750 million. This figure excludes cotton purchases and any purchases in the United States by other sterling area countries which may have been a net drain on the central dollar pool.

Table 2.—*Value of Government financed agricultural exports July 1, 1945–June 30, 1955*

Year ending June 30	Grants				Loans and credits				Foreign currency sales ⁵	Total government financed exports ⁶
	Economic aid ¹	Civilian supplies	USDA donations ²	Total grants	Export Import Bank	UK loan ³	Other ⁴	Total loans and credits		
	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>
1946-----	1, 365	422	-----	1, 787	³ 170	-----	25	195	-----	1, 982
1947-----	421	492	-----	913	³ 274	750	133	1, 157	-----	2, 070
1948-----	739	837	-----	1, 576	17	250	56	323	-----	1, 899
1949-----	1, 516	753	-----	2, 269	35	-----	7	42	-----	2, 311
1950-----	1, 262	461	6	1, 729	24	-----	46	70	-----	1, 799
1951-----	966	175	47	1, 188	14	-----	1	15	-----	1, 202
1952-----	510	68	2	580	89	-----	184	273	-----	854
1953-----	377	58	-----	435	62	-----	34	96	-----	532
1954-----	357	24	67	448	113	-----	-----	113	135	696
1955 ⁷ -----	260	-----	130	390	70	-----	-----	70	351	811
Total-----	7, 773	3, 290	252	11, 315	868	1, 000	486	2, 354	486	14, 156

¹ 1946 and 1947: Lend Lease, UNRRA; 1948: UNRRA, post-UNRRA, Interim Aid, Greek-Turkish Aid; ECA, International Refugee Organization; 1949 to 1955: ECA, Mutual Security and other programs administered by International Cooperation Administration and predecessor agencies (except ECA-GARIOA), including relief shipments under PL 216 (83d Congress) and PL 480, Title II (83d Congress).

² Sec. 416 of the Agricultural Act of 1949, as amended.

³ Estimated.

⁴ 1946–1948: USDA cotton credits; 1949–1951: Natural-Fibers Revolving Fund; 1952: India grain loan, Spanish loan (wheat and cotton); 1953: India grain loan, Pakistan and Afghanistan wheat loans.

⁵ Section 550 of the Mutual Security Act of 1951 as amended; CCC Charter Act, Section 402 of the Mutual Security Act of 1954, Title I of the Agricultural Trade Development and Assistance Act of 1954.

⁶ Due to rounding, individual items will not add to total.

⁷ Preliminary.

Official records of administering agencies including: International Cooperation Administration and predecessor agencies, United States Department of Defense, Export-Import Bank; United States Department of Agriculture; and United States Department of Commerce.

The proportion of agricultural exports directly financed through loans was increased with the passage of the Agricultural Trade Development and Assistance Act of 1954 (PL 480, 83d Congress). Under this authority, as amended, 1.5 billion dollars worth of surplus commodities (CCC investment plus cost of financing) may initially be sold for foreign currencies with no dollar recovery to the United States Treasury.¹⁹ An estimated 50 percent of the proceeds of these sales will be loaned back to the purchasing countries for purposes of economic development. By Congressional mandate, commodities sold must be in excess of the recipient country's normal imports. Assuming that calculations of "normal" imports are correct, this program, in the first instance, will expand

U. S. farm exports more directly than some forms of grant aid.²⁰

Government loans and credits have been included in these calculations of Government financed exports because, by assuming the risk of loss, the Government made possible exports for which private financing was not available. However, to the extent that these loans and credits are repaid, no net drain on the United States Treasury is involved. This is true also because interest rates are usually so set as to cover the cost of financing; furthermore, in the case of many cotton

¹⁹ Reimbursement of the Commodity Credit Corporation by other Government agencies will make part of the \$1.5 billion, in fact a revolving fund. Of the \$361 million obligated through June 30, 1955 (market value including ocean transport), an estimated 47 percent was thus reimbursable.

²⁰ Whereas competing exporters have argued that the United States is building permanent markets by this process, the possibility exists that some of these sales will unfavorably affect United States farm exports after completion of the program (1) if stocks are built up to a point which would limit imports, (2) if the economic development financed with loan proceeds results in greatly increased indigenous production, or (3) if dollar reserves are affected by the payment of U. S. obligations in local currencies rather than in dollars.

loans approved by the Export-Import Bank, actual disbursements are by agent banks under Government guarantee.

Magnitude of Government Assistance

An estimate of the value of agricultural exports moving under grants, gifts, loans, credits or sold for foreign currencies during the 10 years ending June 30, 1955, is summarized in table 2. During this decade Government financed exports averaged \$1.4 billion annually, for a total of more than \$14 billion. Eighty percent of this amount was extended in the form of grants or gifts; only during the last 4 years have grants totaled less than \$1 billion a year.

It must be emphasized that these figures do not measure the entire financial and operational engagement of the United States Government in farm exports. Payments to exporters from so-called Section 32 funds totaled close to \$200 million.²¹ Expenditures to meet the difference between United States domestic prices and maximum export prices under International Wheat Agreement reached more than \$700 million.

Losses to CCC, reflecting the difference between cost of sales and sales proceeds on commodities initially sold or transferred for export²² amounted to more than \$400 million during the 1954 and 1955 fiscal years alone. In addition, the estimated CCC investment plus cost of financing of commodities sold for foreign currencies under Title I of PL 480 exceeded the estimated market value and hence foreign currency receipts by more than \$40 million during the 1954-55 fiscal year.

The barter of Government-held commodities for foreign materials,²³ while essentially a form of surplus disposal, may also be considered as an export stimulant. If the foreign materials were bought for dollars, a smaller part of the resultant dollar earnings of foreign countries might have been spent on United States farm commodities. Furthermore, these exchanges rest in part on the

²¹ These subsidies averaged only \$20 million per year, yet certain commodities, notably wheat and cotton, received substantial assistance in some years.

²² Thus excluding so-called "domestic sales" of commodities which may in fact have been exported.

²³ Authorized under the Commodity Credit Corporation Charter Act (PL 806, 80th Congress), and the Agricultural Trade Development and Assistance Act of 1954 (PL 480, 83rd Congress).

acquisition of foreign materials in excess of long-term stockpile objectives and immediate needs; they are thus in addition to the quantities foreign countries may have been able to sell in the United States, and the farm commodities bartered therefore might be said to represent additional exports. During the past year the scope of barter operations was greatly expanded. Of the \$235 million worth of commodities delivered to exporters under Government barter operations since July 1949, \$125 million was in the 1954-55 fiscal year.

An indirect form of assistance to farm exports should be noted. This arises from legislation that authorizes reimbursement of ocean freight charges for shipments by private relief agencies, and the payment of transportation subsidies for relief shipments by individuals.²⁴ It is highly probable that without these provisions, the volume of relief parcels would have been much smaller. The value of relief shipments between July 1, 1948, and the end of 1954 totaled \$282 million; only about half this amount—the part that represents Department of Agriculture donations—has been included in calculations of Government financed exports.²⁵

Comparison Between Government Financed and Total Exports

The above estimates indicate that, during the postwar period, the value of Government financed exports was 41 percent of the value of total agricultural exports (table 3). Year-to-year variations from this average ranged from a low of 19 percent to a high of 60 percent. For individual commodities or commodity groups, the percentages are both higher and lower than the aggregate figures.²⁶

²⁴ This provision was originally enacted in the Foreign Assistance Act of 1948 (PL 472, 80th Congress).

²⁵ Section 416 of the Agricultural Act of 1949 (PL 439, 81st Congress) provided, among other things, for the donation of surplus commodities to United States voluntary agencies for foreign relief. The authority was broadened in the Agricultural Trade Development and Assistance Act of 1954 (PL 480, 83rd Congress). Before 1949, relief shipments were not included in agricultural trade statistics.

²⁶ During 1949-50, for instance, it reached an estimated 87 percent for grains. United States Department of Agriculture "United States Farm Products in Foreign Trade" p. 20. Washington, 1953.

TABLE 3.—*Value of agricultural exports, United States, July 1, 1945—June 30, 1955*

Year ending June 30	Total value	Government financed	
		Value	Percentage of total
	<i>Million dollars</i>	<i>Million dollars</i>	<i>Percent</i>
1946.....	2, 857	¹ 1, 560	55
1947.....	3, 610	¹ 1, 910	53
1948.....	3, 505	1, 899	54
1949.....	3, 830	2, 311	60
1950.....	2, 986	1, 799	60
1951.....	3, 411	1, 202	35
1952.....	4, 053	854	21
1953.....	2, 819	532	19
1954.....	2, 936	696	24
1955.....	3, 143	² 811	² 26
Total or average.....	33, 150	13, 574	41

¹ Excluding civilian supply programs not included in official trade statistics.

² Preliminary.

As has been pointed out, these figures do not indicate the probable volume of exports that would have taken place without Government assistance. In comparing the two sets of data it must also be borne in mind that trade statistics exclude certain categories of exports and there are differences also with respect to valuation and periods covered between statistics on financing and export statistics. A few examples will illustrate this point.

Exclusion from trade statistics of certain categories of exports mainly affects early postwar data. Immediately after the war, the civilian supply programs were carried out with military supplies located abroad. Direct shipments for this purpose came later. As United States export statistics exclude goods shipped for the use of our military forces abroad, it was not until January 1, 1947, that agricultural trade statistics included the civilian supply programs. Likewise, after July 1, 1950, when the civilian supply program in Korea made use of Army stocks in Japan and Korea, such transfers do not show up in the trade statistics.²⁷ (This exclusion applies to UNRRA purchases of United States military surpluses located abroad.) Thus in comparing Government-financed with total exports, commodities originally intended for use of our Armed Forces but later transferred to other programs must either be subtracted from the Government financed exports (as in table 3), or added to total exports.

It is estimated that the export value (f. a. s.) of civilian supplies distributed between July 1, 1945, and December 31, 1946, totaled about \$600 million; in one sense, our agricultural exports were that much larger than presently recorded.

In arriving at this figure of \$600 million, a minor problem arose from the fact that with the military having procured and transported the commodities in the first instance, f. a. s. costs had to be calculated. A much more serious problem arose because the number of programs being carried on simultaneously resulted in lags and errors in reporting, double counting, cancellations, and later in the revision of civilian supply data. In a number of instances, United States export statistics do not reflect these corrections and revisions; this affects the comparability of the two sets of data at a time when civilian supply shipments were substantial.

Differences in methods of valuation affect the comparability of Government financed and total exports, especially from the standpoint of the quantities included therein. For instance, in December 1947, in face of a threatened wheat shortage, the Commodity Credit Corporation was instructed to turn over to the Army for foreign civilian feeding surplus commodities at a price equal to the caloric value of wheat.²⁸ Obviously,

²⁸ Congress authorized CCC to absorb a loss of \$27.5 million in these operations. Hearings before the Subcommittee of the Committee on Appropriations, U. S. Senate, April 7, 1948, p. 40.

²⁷ BUREAU OF THE CENSUS. FOREIGN TRADE STATISTICS NOTES (April 1949), p. 76.

when a pound of raisins is valued at a pound of wheat, export values become distorted.

The civilian supply programs also utilized surplus military stocks located in the United States, and the values assigned to these surpluses were well below the value of concurrent shipments of similar commodities.²⁹ A similar problem of under-valuation arises from the inclusion in UNRRA shipments of \$138 million of surplus foods (largely Army quartermaster stocks) purchased in the United States.³⁰

More recently, the major problems of valuation have arisen in connection with the export of Commodity Credit Corporation stocks. In a number of instances commodities supplied on a grant basis are reported at CCC cost, including storage; in other instances they enter export statistics at current market value. When the CCC cost is above market prices there is a tendency in comparison with overall exports to overstate the proportion of Government financed exports. Year-to-year comparisons are also distorted. For instance between 1953 and 1954, the value of U. S. wheat exports dropped \$162 million (28 percent), while in terms of quantity the decline was 16 percent. One of the reasons for the decline was that in the earlier year total exports were swelled by a grant of 700,000 tons of wheat to Pakistan. This wheat was recorded at the CCC cost of approximately \$3 a bushel, whereas the value of all other wheat exports averaged about a dollar less. Thus in terms of value not only was the decline in wheat exports overstated, but so was the proportion of Government financing.

Donations for famine relief are generally invoiced at CCC cost, resulting in similar differences. On the other hand, CCC commodities donated for foreign relief under Section 416 of the Agricultural Act of 1949, are invoiced at approx-

imate market prices. Concurrently, CCC sold many of these same commodities to international institutions and foreign governments at negotiated prices which were often far below market prices.

For instance, in the 6-month period ending June 30, 1954, the CCC reported disposition commitments for nonfat dry milk at the following per pound return to CCC: commercial sale for export (including exports under grant aid) 11.3 cents; noncommercial sale to relief societies, 5 cents; noncommercial sale to foreign governments, 2½ cents; sale to the United Nations Children's Fund (UNICEF), 1 cent;³¹ at this time donations for foreign relief under Section 416, were invoiced at 15 cents. In such instances comparison of Government financed with commercial exports would overstate the former if CCC cost was a large component; it would understate it if negotiated prices were the major component of such exports. Furthermore, under an amendment of Section 416, international agencies became eligible for donations.³² Presumably most, if not all such donations will now be recorded at current market values. As sales to these agencies formerly were mostly below market values, the apparent importance of Government financing will increase.

The need for caution in comparing Government-financed with total exports also stems from the fact that the International Cooperation Administration and its predecessor agencies (ECA, MSA and FOA) only report on "paid shipments" or "expenditures." These data represent reimbursement to exporters for previous shipments. In the early ECA days, reports on paid shipments lagged considerably behind actual exports since "a considerable part of ECA's financing involved 'picking up the check' in connection with contracts that had already been let and in many cases shipments that had already passed into history."³³ Although this lag between exports and the time when the data were reported was progressively reduced, comparability with trade statistics continues to be affected by this system of reporting.

²⁹ Over-valuation occurred as well. For instance, the civilian supply programs were charged for CCC wheat at CCC cost at a time when market prices had dropped below that figure. Hearings before the Subcommittee of the Committee on Appropriations, U. S. Senate, April 7, 1948, pp. 41-42.

³⁰ UNRRA, THE CONTRIBUTION OF THE UNITED STATES TO THE UNITED NATIONS RELIEF AND REHABILITATION AGENCY. Washington, 1949, p. 37. Surplus military and lend-lease stocks located abroad and purchased by UNRRA were also procured at prices which had little relation to their f. a. s. cost. (Woodridge, *op. cit.* Vol. I, p. 390.)

³¹ UNITED STATES DEPARTMENT OF AGRICULTURE, COMMODITY STABILIZATION SERVICE, DISPOSITION COMMITMENTS OF CCC COMMODITIES, July 15, 1954.

³² PL 480, Title III (83d Congress).

³³ Hearings before the subcommittee of the Committee on Appropriations, U. S. House of Representatives. Washington, 1949, p. 1052.

Statistics on Government financed exports should not be interpreted as reflecting the extent of government trading operations. This was probably true in the early postwar years, as the lend-lease, UNRRA, and civilian relief programs were largely supply operations in which the United States Government procured the commodities needed for shipment abroad. By Congressional mandate, however, under the Interim Aid and subsequent programs the Government's role shifted from supply to financing. Foreign countries thus increasingly bought through American private traders.

On the other hand, statistics that show the reduced percentages of Government procurement should not be interpreted as reflecting a decline in Government export assistance. Similarly, data released by the Commodity Credit Corporation reporting on the disposition of CCC stocks through commercial sales for export merely indicate that the commodities so listed were handled by private exporters; in fact, most of these commodities move under United States Government export programs.

Finally, it should be noted that, despite the large financial involvement of the United States Government in agricultural exports, in comparison with foreign countries direct government assistance is limited. Foreign countries not only use export subsidies extensively and indirectly subsidize exports through exchange rate manipulation, tax and freight-rate reduction, and export credit guarantees, but engage in bilateral and other state trading operations.

Concluding Remarks

The data presented in this paper are believed to be an accurate measure of Government financed exports under the definition arrived at by the author. The compilation necessarily involved many judgments as to the inclusion and interpretation of various items. Consequently, like all statistics, those presented herein should not be used for further analysis or as the basis for policy determinations without first making the necessary adjustments required by the particular purpose for which the data are to be used.



The Marketing Bill for Agricultural Products

By Kenneth E. Ogren

Statistics on the marketing bill for agricultural products presented in this article supplement and amplify those originally prepared by the author for the chapter "How Much Does Marketing Cost Us?" published in Marketing—The Yearbook of Agriculture, 1954 (pp. 14–18). In the article published here the author discusses the interpretation of these statistics with special reference to the use of a "value added" concept.

AMERICAN CONSUMERS spend a considerable proportion of their income each year for goods derived from agricultural products. A large part of these expenditures is for charges added to the cost of farm products after the first sale by the farmer-producer. Questions frequently arise as to the amount of the total marketing bill¹ and why farmers receive such a small part of consumer expenditures for agricultural products.

A marketing bill of almost \$50 billion.—The estimated marketing bill for consumer goods derived principally from domestically produced agricultural products was \$48.7 billion in 1954 (table 1). A comparable estimate of the value of these products at the farm level gives \$21.3 billion. Consumer expenditures for the products total \$75 billion, but that amount includes about \$5 billion in excise taxes for tobacco products and alcoholic beverages. These excise taxes were deducted from the marketing bill.

Users of data in table 1 are reminded that these statistics are not comparable with estimates of consumer expenditures for these product groups, which are available from the United States Department of Commerce, nor with total cash receipts of farmers from sales of their products.

¹As used in this article, the marketing bill measures the difference between consumer expenditures for farm products and payments received by farmers for equivalent quantities of produce. In this context, marketing includes all operations involved in moving agricultural products from farms on which they are produced to consumers at the time and in the form they are bought. This definition of marketing differs from the concept accepted in some industries. As Frederick V. Waugh has commented, "agricultural economists have rather generally followed a broad definition of marketing, covering not only buying and selling but also such subjects as transportation, processing, and storage." (*Readings on Agricultural Marketing*. Iowa State College Press, Ames, Iowa, 1954. Page 2.)

Total consumer expenditures for food, clothing and shoes, alcoholic beverages, and tobacco products, in 1954, as reported by the Department of Commerce are about a third higher. The estimate of \$75 billion in table 1 excludes expenditures for imported products such as coffee, tea, bananas, sugar, pineapples, wool, and silk. Also excluded are some nonfarm products such as seafoods, and clothing made from synthetic fibers. In addition, a part of consumer expenditures for food as reported by the Department of Commerce represents the valuation of food consumed on farms where produced, and does not enter the marketing system.

Cash receipts from farm marketings in 1954 likewise were more than a third higher than the farm value given in table 1. The difference between the \$21.3 billion and total cash receipts of \$30 billion is accounted for by sales of products for export, industrial, and military use; by sales of nursery products, forestry products, and other miscellaneous products not included in consumer expenditures for the subgroups in table 1; by CCC loans and an increase in stocks;² and by interfarm sales of livestock, feed, and seed. In addition to its narrower scope, the farm value in table 1 is more of a "net" figure than total cash receipts, because it does not include these "interplant" transfers of livestock, feed, and seed.

A final note should be added regarding the scope of this estimate of the marketing bill for agricultural products. This bill was estimated only for the major groups of consumer items that are derived principally from agricultural prod-

²A net increase in CCC loans and a net increase in stocks also added to the difference between farm cash receipts in 1954 and the farm value of products bought by consumers. Receipts from CCC loans, which are included in cash receipts from farm marketings, represent value of loans minus value of redemptions.

TABLE 1.—*Consumer expenditures, farm value, and marketing bill for principal groups of agricultural products, 1954*

Item	Consumer expenditures	Farm value	Marketing bill ¹	Excise taxes
	<i>Billion dollars</i>	<i>Billion dollars</i>	<i>Billion dollars</i>	<i>Billion dollars</i>
Food.....	49. 4	18. 7	30. 7	-----
Nonfood:				
Textile products.....	10. 0	1. 4	8. 6	-----
Alcoholic beverages.....	8. 0	. 3	4. 5	3. 2
Tobacco products.....	4. 8	. 7	2. 1	2. 0
Leather products.....	3. 0	. 2	2. 8	-----
Total.....	25. 8	2. 6	18. 0	5. 2
All products.....	² 75. 2	² 21. 3	² 48. 7	5. 2

¹ Consumer expenditures minus farm value of equivalent quantity, except for alcoholic beverages and tobacco products where estimates of Federal, State, and local excise taxes also are subtracted.

² These statistics are not directly comparable with "approximations" published elsewhere for the year 1953.

ucts. Not included in any of these groups are many nonfood products like paint and soap which are manufactured mainly from fats and oils. An automobile may have farm-produced raw materials in its upholstery, cushions, tires, and paint. In fact, most consumer goods, both durable and nondurable, probably contain an agricultural product in one form or another.

Interpretation of these statistics.—This article brings together available data on the marketing bill and corresponding farm value for principal agricultural products, both food and nonfood groups. Because of the many approximations made in deriving these estimates,³ these statistics admittedly are not so accurate and precise as would be desirable for some purposes. But the principal problem does not lie in developing the statistics; it is in making useful and appropriate interpretations and analyses from them. Major attention here is directed toward this latter purpose.

The data in table 1 lead to some obvious conclusions. Charges for marketing agricultural products were more than double farmers' returns. The farmer's share of the consumer's dollar spent for these major agricultural products—including several nonfood groups in addition to food—was less than 30 percent. But, as pointed out earlier, we made rather arbitrary decisions as to what

products to include in these comparisons. If we added more of the nonfood products that do contain agricultural products as a raw material in one form or another, we should probably have added relatively more to consumer expenditures than to the total farm value in table 1. Then we would have come out with even less for the farmer's share.

It is evident that farmers receive a much larger proportion of consumer expenditures for food products than for nonfood products, and that agriculture's principal source of income is from the sale of food products rather than nonfood products. But one can easily find examples of individual food products for which the farmer's share is as low as for many nonfood products. For some of these—bread, crackers, prepared breakfast food, corn sirup—the final form in which the product is bought by the consumer differs greatly from the raw product sold by the farmer. Processing off the farm is as important for these food products as for most nonfood products.

Clearly, these figures in themselves provide little basis for judging the equity of either farm returns or marketing charges. But these statistics can be used as a starting point to derive more specific measurements of the relative contributions of farmers, processors, distributors, and other groups who add utilities to the product as finally bought by consumers. The application of the "value added" concept to the marketing-bill statistics is explored in the following section.

³ Methods used in arriving at estimates for each subgroup are described briefly in the last section of this paper.

"Value Added" as a Yardstick

"Value added by manufacture" is a statistic that for many years has been used by the United States Bureau of the Census in its periodic Census of Manufactures. Value added is calculated, according to the Bureau, "by subtracting the cost of materials, supplies, containers, and fuel consumed, purchased electric energy, and contract work from the value of products shipped." This statistic "measures the approximate value created in the process of manufacture. It provides the most satisfactory census measure of the relative importance of given industries. . . ."⁴

Recently, the importance of developing a similar concept of "value added by marketing" has been stressed in several articles and reports.⁵ They point out that the general use of value added in manufacturing and costs in marketing or distribution has left the impression that manufacturing adds value whereas distribution adds costs.

Standard textbooks in marketing, both agricultural and general, invariably emphasize that necessary functions are performed by the marketing system in getting goods from the producer to the consumer. In the traditional utility framework, marketing activities create time, possession, and place utilities, whereas the production process creates form utility. To many people, however, production means something useful and necessary, because it changes the form of the product, and

marketing, though useful and necessary, is regarded as less essential. Wholesaling, retailing, and other distributive activities without question do add value to agricultural products; they are a part of the overall economic activity of creating goods and services to satisfy human needs and wants.

Actually, the derivation of statistics that apply solely to production or marketing is difficult and, for many purposes, perhaps unnecessary. Farmers do perform some distributive functions through roadside and door-to-door sales of products, though with the increased specialization in our economy this is of declining importance. Manufacturing firms carry out sales activities that are clearly distributive in nature. Cutting up a beef carcass by a retailer would probably be classified as the creation of form utility or production. Many other examples could be cited to illustrate the difficulties in classifying establishments as exclusively production or marketing.

Here, we shall consider the application of the value added concept in marketing by the type of establishment or institutional approach, rather than by functions. The functional approach is not without value but it is more difficult to apply with the available data.⁶

Value added by agriculture.—Of the \$75 billion that consumers spent for farm products in 1954 (table 1), an estimated \$15 billion represent value added by agriculture. This measures the gross returns received by agriculture for its labor and capital, excluding the cost of production materials and other services which are furnished by the nonagricultural part of our economy.

The definition of "value added" given by the Bureau of the Census was applied directly in deriving this estimate of \$15 billion. The farm value which was used as a starting point is analogous to the "value of products shipped" used in the Census of Manufactures. The value of intermediate products originating outside agriculture of \$6.3 billion was derived from total farm expenditures for feeds and seeds purchased (adjusted for cash farm receipts from sale of feeds and seeds), fertilizer and lime, operation of motor

⁴ U. S. Bureau of the Census. ANNUAL SURVEY OF MANUFACTURES: 1953. Washington. U. S. Govt. Printg. Off. 1955, pp. 10-11.

⁵ Beckman, Theodore N. THE VALUE ADDED CONCEPT AS APPLIED TO MARKETING AND ITS IMPLICATIONS, FRONTIERS IN MARKETING THOUGHT, pp. 83-99. (Contributed papers, Conference of American Marketing Association, December 27-28, 1954; published by the Bureau of Business Research, Indiana University).

Monieson, David D., ON MEASURING VALUE ADDED BY MARKETING, FRONTIERS IN MARKETING THOUGHT, pp. 111-36.

Eggert, Robert J., and others, VALUE ADDED BY DISTRIBUTION, BOSTON CONFERENCE ON DISTRIBUTION. Boston Chamber of Commerce. Proc. 25 (1953): 65-71.

In a panel review of governmental statistical programs before the Joint Congressional Economic Committee, the U. S. Chamber of Commerce "tagged as a 'serious gap' in the Federal statistical program the lack of data on the value added to goods as they pass through wholesale and retail outlets." (New York Journal of Commerce, Feb. 10, 1955, p. 6.)

⁶ Professor Monieson concluded in his paper, referred to earlier, that "at present, it is not too practical to measure value added by marketing activities or functions."

vehicles, electricity, containers, and other miscellaneous supplies and expenses, and gross rents paid to nonfarm landlords. The total expenditure for these items was reduced by a fourth to allow for the part of the total farm output not represented here.⁷ In some instances, gross rents paid to nonfarm landlords may appropriately be included in value added by agriculture, particularly if value added were being related to total investment in agriculture rather than the agricultural labor force and capital owned by it.

A "value added" statistic for the total agricultural industry was first published in 1951 by Kendrick and Jones.⁸ Although the authors call their statistic "gross national farm product," they refer to it as a "value added concept" which "measures the value added by the industry to the products it consumes in production." They compute the gross national farm product by deducting value of materials used up in production (including gross rents paid to nonfarm landlords) from total value of farm output which includes cash receipts, value of products consumed on farms where produced, gross rental value of farm homes, and the net change in all farm inventories. With statistics available for farm value (or value of shipments), the method used to derive value added in this paper was easier to apply than the procedure used by Kendrick and Jones in deriving an estimate for the total agricultural output, although if allowance were made for difference in coverage the two methods should give identical results.

Value added by nonagricultural groups.—According to data from the Annual Survey of Manufactures for 1953, value added by manufacturing establishments to the consumer goods included in our statistics amounted to at least \$16 billion.

⁷ This relationship of the farm output (to which the statistics in this article relate) to total farm output was derived from data on the utilization of farm products prepared for Agriculture Handbook 91, MEASURING THE SUPPLY AND UTILIZATION OF FARM COMMODITIES. U. S. Dept. Agr. (in manuscript).

⁸ Kendrick, John W. and Jones, Carl E., GROSS NATIONAL FARM PRODUCT IN CONSTANT DOLLARS, 1910-50, SURVEY OF CURRENT BUSINESS: September, 1951, pp. 13-19. An article in the August 1954 issue of that periodical, by L. Jay Atkinson and Carl E. Jones, FARM INCOME AND GROSS NATIONAL PRODUCT, revised and extended the statistics and analysis presented in the first article.

Value added to farm food products amounted to an estimated \$8 billion; alcoholic beverages about \$1.5 billion; tobacco products close to a billion dollars; and leather products something over a billion dollars. Of the more than \$10 billion added by the textiles and apparel industries, perhaps \$5 billion was added to the value of household products made from domestic farm-produced fibers. Even a rough approximation is difficult because of the importance of synthetic fibers, imported wool, and nonhousehold uses. Value added by manufactures is not yet available for 1954 but "national income by industrial origin" published in the July 1955 issue of the Survey of Current Business indicates that there was no appreciable change in these groups between 1953 and 1954. Trends in national income by industrial origin are similar to those in the value added data although the income data exclude, in addition to cost of materials, such items as depreciation charges and indirect business taxes.⁹

Subtracting from the total marketing bill the \$16 billion which represent value added by manufacturing firms, the remaining \$33 billion represent value added by distribution agencies—local assembly and wholesaling, retailing (including eating and drinking places), and transportation. Also included in this residual are the supplies and materials bought by these distributive agencies and manufacturing establishments from other segments of the economy (table 2).

Retailing establishments account for the largest single portion of the residual item. Wholesaling and transportation agencies take much smaller parts. In arriving at value added by distributive agencies, the cost of packaging materials, other supplies, and purchased utilities would be deducted from the gross margin. These data are not generally available, but financial statements for some of these companies indicate that these deductions are not a large part of gross margin. Based on available data on gross margins and sales of retailing establishments, however, it would appear that value added in retailing accounts for perhaps 50 percent or more of the \$33 billion. Transportation probably is around 10 percent of this residual. The transportation bill for food

⁹ For more complete description of these differences, see the footnote to a table on pp. 176-177 of NATIONAL INCOME, 1954 edition, U. S. Dept. Commerce.

TABLE 2.—*Value added components in consumer expenditures for principal groups of agricultural products, 1954*

Item	Value added
Value of products shipped by agriculture:	<i>Billion dollars</i>
Value added by:	
Agriculture.....	15. 0
Nonagricultural service industries.....	6. 3
Total.....	¹ 21. 3
Value added after sale by farmers:	
Manufacturing establishments.....	16. 0
Distribution agencies:	
Industries supplying services to manufacturing and distribution agencies.....	32. 7
Total.....	48. 7
Total.....	² 70. 0

¹ Corresponds to farm value in table 1.

² Consumer expenditures of \$75.2 billion (table 1) less excise taxes of \$5.2 billion.

products is about \$3 billion, most of which represents value added by transportation agencies. Transportation of nonfood products going into domestic civilian consumption probably would not add appreciably to the total transportation bill.

Summary and conclusions.—On a value-added basis, agriculture, manufacturing, and retailing account for approximately equal shares of the \$75 billion referred to in table 1. These three sectors of the economy each accounts for 20 percent or more of the consumer's dollar spent for goods derived mainly from domestically produced farm produce. The rest is divided among wholesaling, transportation, other distributive agencies, and a host of other industries that furnish materials and services to the agencies directly engaged in the production and marketing of farm products.¹⁰

Comparisons between food and nonfood groups show that about 85 percent or more of the value

¹⁰ Excise taxes on tobacco products and alcoholic beverages are treated as a separate item in total consumer expenditures in table 1. They are excluded from the computation for value added because of the special nature of these taxes and the large proportion of the retail price of these products that they represent. All other taxes are included in value added. A discussion of the treatment of government as a factor of production is given in the paper by Professor Beckman referred to in footnote 5. This subject is also discussed by Professor Monieson, together with several references to various definitions of "net" and "gross" value added concepts.

added by agriculture is for food products, and that at least half the value added by manufacturing is for nonfood products (table 2). Agriculture and manufacturing can be classed as primarily production, but they include some distribution functions. Thus most of the actual production or creation of "form utility" of food products is done on the farm, whereas processing of nonfood raw products after they leave the farm is by far the most important in terms of value added. Nonfood products sold by farmers derive their value for the most part from their usefulness as raw materials in the manufacture of finished goods.

Application of a value-added concept to the production and marketing of agricultural products, using an institutional or establishment approach, appears to be both feasible and useful. Further studies undoubtedly would yield more precise estimates for more value-added components than were derived for this article.

An advantage of the value-added concept that is stressed by some of its proponents is that it emphasizes productive aspects of both production and marketing processes. This is particularly applicable to marketing of agricultural products; more emphasis has been placed on cost aspects of marketing agricultural products than most other products; then, too, the definition of agricultural marketing as commonly used includes processing as well as distribution. With the use of value added, the same terminology is applied to all groups regardless of the particular functions they perform. But this is not a compelling reason in itself for using value added. The importance and necessity of marketing and marketing functions can be shown in other ways.

Several illustrations can be cited in which value added provides a better measurement than that of more usual statistics on agricultural marketing. Value added gives the most meaningful comparisons of the share of the consumer's dollar actually received by the different sectors of the economy as it provides an unduplicated measurement of the gross returns received by the various groups. For example, an increasing share of cash farm receipts is represented by motor fuels, fertilizers, and other purchased production supplies.¹¹ Therefore, the farmer's share of the consumer's dollar as measured by value added has declined relative to the

¹¹ Kendrick and Jones, *Op. Cit.*

farmer's share as measured by the more usual comparisons of farm and retail prices. In discussions of farm and marketing shares of the consumer's dollar, statistics on net income after taxes often are cited to illustrate that profits of marketing agencies are a small percentage of the retail price. These statistics are useful in pointing out that costs, including taxes, of marketing agencies make up a large part of their gross margins. It is almost impossible, however, to obtain comparable figures representing net income to farmers.

Statistics on cost breakdowns of the marketing bill would be more meaningful if compared to value added. Statistical series are compiled of the numbers and costs of labor employed by agencies engaged in processing, transportation, wholesaling, and retailing of farm food products.¹² For more appropriate comparisons, trends in these labor costs and numbers should be related to trends in value added by these agencies rather than to the total marketing bill which includes value added by other agencies.

Value added measures the gross return in terms of current prices received by various sectors of the economy for their contributions, but it does not evaluate these contributions in terms of cost, efficiency, or any of the input factors.¹³ It is not a substitute for cost concepts but an additional tool that can be used to supplement and complement other analyses of marketing costs and charges. Nor does the farmer's share as measured by value added by farmers tell us anything about the equity of farmers' returns and that going to other groups. It does provide a more satisfactory starting point, however, in judging returns against inputs of labor and capital. Value added is also a measure of output in current dollars or prices. (Kendrick and Jones also computed farm gross national product in constant dollars by using appropriate price deflators.) Therefore, it should be useful in input-output studies, particularly in aggregate types of studies where inputs by agriculture and other sectors of the economy that add value to farm products are related to output.

¹² Ogren, Kenneth E., and Parr, Kathryn, *LABOR IN THE MARKETING OF FARM FOOD PRODUCTS*, April 1955 issue of this journal.

¹³ For example, in recent years the farm-to-retail price spread for *some* food products has increased relative to the farm value of the raw materials, not because of more marketing services, but because of higher costs of performing the same marketing services.

The marketing bill for each of the subgroups in table 1 was derived by estimating separately farm value and consumer expenditures. In general, the farm value was estimated by adjusting cash farm receipts for the part of the product not going into domestic civilian consumption. The method used for estimating consumer expenditures depended on the data available. For some groups the estimate was derived by dividing the farm value by the percentage of the consumer's dollar received by the farmer. The statistics regarding the farmer's share are those given in the series of farm-to-retail price spreads published regularly in *The Marketing and Transportation Situation*. For other groups consumer expenditures were estimated from U. S. Department of Commerce statistics with the farmer's share method used as a check, when possible.

Consumers spent an estimated \$49.4 billion in 1954 for domestically produced food products marketed for civilian consumption. This food was valued at its cost at the place in the marketing system where it was bought by consumers. This figure was derived by adjusting the retail-store cost of farm food products regularly published in *The Marketing and Transportation Situation* for the extra costs of food bought in eating places and for the lower cost of food bought by consumers direct from farmers or wholesale channels.¹⁴ Farmers received an estimated \$18.7 billion from the sale of these food products marketed for civilian consumption, after adjustment for the value of nonfood byproducts. This figure is the same as that published in *The Marketing and Transportation Situation*.

Consumer expenditures for textile products in table 1 are for clothing and household textiles derived from domestically produced wool and cotton. The farm value of the lint cotton used in the clothing and household textiles bought by consumers in 1954 was derived by first estimating the quantity of cotton that went into these products. Total mill consumption of cotton was adjusted for imports, for cotton used in products exported,

¹⁴ See *The Marketing and Transportation Situation*, 118, July 1955, p. 8. The adjustments to the retail-store cost for food sold through channels other than through retailers were prepared with the assistance of Marguerite C. Burk, Agricultural Economics Division, AMS.

and for cotton used in industrial products—tires, bagging, insulation, twine and cord, etc.¹⁵ The ratio of the quantity of cotton that was used for clothing and household textiles for United States consumption to the total quantity of lint cotton produced was applied to cash farm receipts from sales of lint cotton to obtain the farm value. As these data on the utilization and marketing of cotton are available for crop years (beginning in August) the farm value for 1954 is the average of the 1953 and 1954 crop years.

Mill consumption of apparel wool in 1954 was about double the domestic production. Wool used in industrial products and products exported is relatively small. Therefore, most of the cash receipts from wool in 1954 are included in the farm value of textile products.

The first step in estimating consumer expenditures for clothing was to prorate total expenditures for clothing (as reported by the Department of Commerce) by type of fabric. This prorating was based on the percentages of the value of the purchases by the apparel industry of the different fabrics—wool, cotton, rayon, and so on. The estimates for wool and cotton clothing were then adjusted to allow for imported fibers which are a substantial part of the total for wool. It was assumed that a major part of the \$2.4 billion reported by the U. S. Department of Commerce for semi-durable housefurnishings (towels, sheets, and so on) was made up of cotton products.

The percentage of consumer expenditures represented by the farm value corresponds approximately with those obtained in farm-to-retail price spread series. However, the direct estimate of consumer expenditures described in the preceding paragraph yielded more consistent year-to-year trends than those obtained by inflating the adjusted farm receipts from cotton and wool by

¹⁵ Adjustment for industrial use is based on data for 1953 and preliminary data for 1954, published by the National Cotton Council of America in "Cotton Counts Its Customers," April 1955.

farmer's share percentages based on a limited number of cotton and wool items.

Cash farm receipts from the sale of tobacco leaf (adjusted for exports and change in stocks) were divided by the farmer's share of the retail cost of tobacco products to obtain an estimate of total consumer expenditures. An alternative method was used for deriving estimates of farm value and consumer expenditures. Consumer expenditures for cigarettes, cigars, and other products, reported separately by the Department of Commerce, were adjusted for imports on the basis of quantity data. Farmer's share percentages were then applied to obtain farm value. The two methods gave almost identical results. Statistics on tobacco products are more adequate, partly because of data collected for tax purposes, so it is not surprising to come up with better results than for some other groups, especially textile products. With the exception of local taxes, the excise taxes, which are given separately in table 1, are from data compiled by the Tobacco Division, AMS, from reports of the Internal Revenue Service, and other revenue reports.

Consumer expenditures for alcoholic beverages were derived directly from estimates by the Department of Commerce with a downward adjustment of about 10 percent to allow for value of imported products. With the statistics now available it is impossible to arrive at an exact estimate of farm value of ingredients going into alcoholic beverages, but it is known that this is a small figure; so a large percentage error does not have a significant effect on the total farm value and marketing bill. Industry reports on quantities of ingredients formed the basis for the estimate of farm value. Federal and State taxes on alcoholic beverages are available because of tax reports.

The farm value of leather products was derived mainly from estimates of imputed byproduct values made in connection with price-spread and marketing-bill computations for meat products. Consumer expenditures are estimated from Commerce and Census reports on shoes and other leather products.

A Foundation for Objective Forecasts of Cotton Yields

By Walter A. Hendricks and Harold F. Huddleston

As part of the expanded research program in the Agricultural Estimates Division, Agricultural Marketing Service, United States Department of Agriculture, extensive plant observations were made over the old Cotton Belt during the 1954 season. The data were studied in relation to final yields so that similar observations, taken before harvest in the 1955 season, may be used to make experimental forecasts of yields. This paper summarizes the findings of the 1954 work and indicates how the results may be used in 1955. The results are in terms of average relationships for the region as a whole and should not be expected to apply to any one locality within the region.

FOR THIS STUDY, a sample of about 200 cotton fields was selected, with probabilities proportional to size of fields, from a list of about 3,000 farms that were enumerated in a probability area sample in June 1954. Each sample field was visited as of August 1 and September 1 to get counts of bolls, blooms, and squares, together with data on weevil and other damage. On the second visit samples of open cotton were weighed and small portions were taken to the office for determinations of moisture loss. A third visit to the sample fields was made at the end of the season to get farmers' reported production for the entire farm and for each sample field, and to check the amount of open cotton and the number of unopened bolls left in the sample fields after harvest.

The sampling units used for plant observations within fields consisted of two adjacent 10-foot row segments; two such double-row units were selected in each sample field. The August 1 and September 1 plant observations were taken on the same units; new units were chosen for the post-harvest observations.

All hills or plants, and the burrs, open bolls, and large unopened bolls in the sampling units were counted. The fruit counts were by separate categories in the September 1 survey, but they were lumped together in the August 1 survey. In both surveys, however, detailed counts by categories were made on 2 hills or plants for each 10-foot row section. These detailed counts also included a count of squares, blooms, and small bolls. Fruit was stripped from half of these plants and counted again, to verify the onplant counts. The picked fruit was examined for weevil damage.

These data were studied from the viewpoint of developing an objective forecasting procedure in regard to yields.

The Multiple Regression Approach

The multiple regression approach ordinarily comes to mind first in such problems. When data on final yields are available, together with counts of squares, blooms, small bolls, large bolls, and open bolls, as of a given date, a multiple regression equation presumably can be developed to describe the relationship of fruit counts as of that date to final yield. But two difficulties arise in attempting to evaluate the net regression coefficients in such an equation. Net regression coefficients estimated from observed data often have large sampling errors. But there is a still more serious objection to this approach. If the equation is to be used to forecast yields in future years, it should describe the relationship between fruit counts and yields over time. In this case, that means a "between-year" regression. But when data are at hand for only one year it is impossible to compute the "between-year" regression.

As stated previously, growers were requested to report final yields on the sample fields at the end of the season. But those reported yields were apparently at too low a level, as compared with Bureau of Census ginnings data for the region as a whole. For this reason, no attempt was made to relate fruit counts on the sample fields to the yields reported for these fields. Instead, the fruit counts as of August 1 were related to the September 1 count of large bolls plus open bolls. Data from 4 hills, 2 per sampling unit in each sample field on which fruit was counted both months, were

used for this purpose. The resulting equation is

$$Y = 1.503 + 0.888X_1 + 0.0773X_2 + 0.2540X_3 + 0.3795X_4$$

In this equation Y is the number of large bolls plus open bolls counted on 2 hills in a sampling unit as of September 1 and the independent variables are corresponding August 1 fruit counts on the same hills as follows:

X_1 = number of large bolls

X_2 = number of small bolls

X_3 = number of blooms

X_4 = number of squares

If this equation is interpreted literally, it says that the squares and blooms present on August 1 had a greater probability of reaching the large-boll stage by September 1 than did the small bolls. Such a conclusion would hardly be in accord with fact. The most reasonable interpretation that can be placed upon these results is that they arose from the varying degrees of maturity of plants in different parts of the Cotton Belt and that the relationship implied by the equation is spurious. It was decided not to pursue this approach further.

A "Probability of Survival" Model

As the standard multiple-regression approach is subject to the limitations outlined above, it was decided to attempt to deduce the numerical values of the net regression coefficients instead of attempting to evaluate them from the observed data. This involves setting up some sort of realistic hypothesis about the probability of survival for each category of fruit, counted as of August 1, during the period August 1 to September 1. One of the simplest hypotheses that might be proposed is that this probability is equal to the age of the fruit on August 1 divided by the age at which it is "mature."

About 21 days are normally required for a new square to become a bloom. Hence, the average age of the squares counted as of August 1 may be taken as approximately 10.5 days.

Blooms normally exist for only about 2 days before they become small bolls. A small boll becomes a "large" boll 21 days thereafter. Hence, the average age of fruit in the bloom stage can be taken as 22 days and that in the small-boll stage as 33.5 days.

From this discussion it appears that the total time required for a new square to reach the large-boll stage is $21 + 2 + 21 = 44$ days. The probabilities of survival may thus be estimated as shown below.

Large bolls: $44/44 = 1.000$

Small bolls: $33.5/44 = .761$

Blooms: $22/44 = .500$

Squares: $10.5/44 = .239$

The equation for translating August 1 fruit counts into an estimate of large bolls present on the same plants as of September 1 would thus take the form,

$$Y = X_1 + 0.761X_2 + 0.500X_3 + 0.239X_4$$

Applying this equation to the August 1 fruit counts gives an estimated average of 58.1 large bolls per 10 feet of cotton row as of September 1. This compares with an average of 56.6 large bolls actually counted per 10 feet of row on that date. This suggests that a satisfactory model can be devised by some such approach as an alternative to the usual multiple regression approach.

The simple hypothesis upon which the equation is based could doubtless be refined much further but such attempted refinements would be meaningless unless they were accompanied by more detailed objective data with which these hypotheses could be tested.

The research program for the present crop year makes provision for tagging fruit in the various categories on sample plants early in the season and tracing the development of each class of fruit throughout the season. This should be of considerable help in arriving at a valid forecasting equation. Meanwhile, several alternative hypotheses to the simple one described above have been tried on an exploratory basis. These all lead to equations with coefficients approximately equal to those obtained above.

An Empirical Approach

Until some of the questions raised by the studies outlined above can be answered, an approach that compares the fruit counts in the various categories made on August 1 with those made on September 1, and with the situation at harvest, can be used to determine these probabilities empirically. For convenience, all counts are expressed in terms of counts per 10 feet of cotton row.

As of August 1 these counts are 78.5 squares, 28.7 blooms plus small bolls, and 22.6 large bolls.

Bloom and small-boll counts were combined because the life of a bloom is so short that it did not seem necessary to treat blooms separately.

As of September 1 the counts are 12.1 blooms plus small bolls and 56.6 large bolls. Squares were not counted because it was believed that squares present on September 1 would not be likely to mature by harvesttime.

To complete the picture, a count of bolls picked at harvest and a count of fruit still on the plants after harvest are needed. It was intended to derive an estimate of bolls picked by dividing the farmer's reported yield for each sample field after harvest by the weight of cotton per boll, derived from weighings of open cotton made as of September 1. But, as stated earlier, farmers' reports on yields for the sample fields appeared to be at too low a level when compared with Census ginnings data at the end of the year. For that reason it seemed preferable to base the estimate of the number of bolls picked in the sample fields on the official yield estimate for the entire region.

The weight of seed cotton per boll, found by weighing cotton picked from open bolls as of September 1, was only slightly higher than the weight customarily assumed by cotton growers—1 pound of seed cotton per 100 bolls. Therefore, the standard factor was used. Assuming that 1 pound of seed cotton is equivalent to 100 bolls, and that 100 pounds of seed cotton are equivalent to 37 pounds of lint, it was possible to estimate the number of bolls per 10 feet of row picked by farmers.

The numbers of open and unopened bolls remaining on the plants after harvest were counted when the post-harvest observations were taken. Adding these counts to the estimate of bolls picked by the farmer gave a total estimate of 68.8 bolls per 10 feet of row at harvesttime. Of this total, 91 percent represents fruit picked by the farmer and 9 percent represents fruit still on the plants after the farmers finished harvesting. About half of this 9 percent represents open bolls that were missed in the harvesting operation or that opened after harvest was completed. The remaining half represents bolls that failed to mature, including those that were killed by drought.

Several features of these figures are worthy of note. First, the sum of small bolls and large bolls counted as of September 1, $12.1 + 56.6 = 68.7$, agrees almost perfectly with the total boll "count" of 68.8

at the end of the season. This suggests that a count of both small and large bolls is all that is needed as of September 1 to estimate the total boll count at the end of the season. An additional observation is that the count of 56.6 large bolls as of September 1 is larger than the sum of the small and large bolls counted as of August 1; some of these large bolls developed from squares counted as of August 1.

To formulate a mathematical expression of these relationships, let X_1 , Y_1 , and Z_1 represent August 1 counts of squares, blooms plus small bolls, and large bolls; Y_2 and Z_2 the September 1 counts of blooms plus small and large bolls, and Z_3 the total boll count at the end of the season.

The September 1 count of blooms plus small bolls may be regarded as the August 1 count, Y_1 , plus an unknown fraction of the August 1 square count, minus an unknown fraction of Y_1 which developed into large bolls between August 1 and September 1:

$$Y_1 + a_1X_1 - bY_1 = Y_2 \quad . \quad . \quad . \quad (1)$$

The September 1 count of large bolls contains the large bolls counted as of August 1, plus an unknown fraction of the August 1 square count, plus an unknown fraction of the August 1 blooms, plus small bolls. This last component is the same quantity, bY_1 , that appears in the preceding equation. The relationship is

$$Z_1 + a_2X_1 + bY_1 = Z_2 \quad . \quad . \quad . \quad (2)$$

It was pointed out earlier in this article that the total boll "count" at the end of the season is almost exactly equal to $Y_2 + Z_2$. But to complete the picture, let that count be represented by the large bolls counted September 1, plus an unknown fraction of blooms and small bolls counted September 1. It is also assumed that the fraction of blooms and small bolls maturing to large bolls between September 1 and harvest is equal to the fraction maturing between August 1 and September 1. That is,

$$Z_2 + bY_2 = Z_3 \quad . \quad . \quad . \quad (3)$$

Substituting the observed data for the variables in equations (1), (2), and (3):

$$28.7 + 78.5 a_1 - 28.7 b = 12.1$$

$$22.6 + 78.5 a_2 + 28.7 b = 56.6$$

$$56.6 + 12.1 b = 68.8$$

The fractions, a_1 , a_2 , and b , can be evaluated from these equations. But as it is clear from the third equation that $b=1.0$ almost exactly, there is little point in making an exact solution. This value of b could also be deduced on logical grounds alone because less than a month is required for blooms and small bolls to reach the large-boll stage. Taking $b=1.0$ gives

$$a_1=0.154$$

$$a_2=0.068$$

This means that 15.4 percent of the August 1 squares become bloomers or small bolls by September 1 and another 6.8 percent of the August 1 squares become large bolls by September 1. Furthermore, all of the blooms, and the small and large bolls counted as of September 1 appear to be in the picture as mature cotton or unopened bolls at the end of the season.

These relationships permit experimental objective yield forecasts to be made from August 1 and September 1 fruit counts during the 1955 crop season. On August 1 the following equation may be used:

$$Z_3=0.222X_1+Y_1+Z_1 \quad . \quad . \quad . \quad (4)$$

This provides a forecast of total bolls per 10 feet of row at the end of the season. In terms of pounds of lint per acre, assuming 37 pounds of lint per 100 pounds of seed cotton, and assuming 1 pound of seed cotton per 100 bolls, the yield per acre, unadjusted for normal losses, would be $4.67Z_3$.

On September 1 the forecast of Z_3 is simply

$$Z_3=Y_2+Z_2 \quad . \quad . \quad . \quad (5)$$

This forecast is also in terms of number of bolls per 10 feet of row; it must be multiplied by 4.67 to convert it into pounds of lint per acre.

A Basis for Forecasting Yields in 1955

Three distinct approaches that utilize fruit counts on August 1 and September 1 have been described. Each provides a basis for forecasting cotton yields. All the models are similar in that they estimate or predict the number of mature bolls to be produced as the first step; this number is multiplied by an average weight of seed cotton per boll to give the yield for the sample plot or a given fraction of an acre. As mentioned earlier, the multiple regression approach may not provide very stable estimates of the net regression coefficients or a basis for determining between-year coefficients. For this reason little reliance will be placed on this approach in 1955.

The other two models are preferred as a basis for predicting total mature fruit because they conform more closely to the known behavior of the fruiting habits of the cotton plant. Any forecast of yield based on fruit counted as of a given date, however, will require an allowance for harvesting loss and for failure of bolls to open. During the 1954 season, losses from these combined sources amounted to 9 percent.

The behavior of this deduction from year to year is not known—at present there is no basis for assuming that the 1954 deduction represents the usual situation or that it is either larger or smaller than usual. In absolute terms, such losses have been found, in general, to be related to the level of yield. Therefore, it is hoped that the assumption of a constant fraction or a proportional allowance for harvesting losses and unopened bolls may serve as a good first approximation. The results so far suggest that detailed plant observations show much promise as a tool for making forecasts of yields.

Book Reviews

American Agriculture: Its Structure and Place in the Economy [A mid-century appraisal of the current status of farms and farm people.] By Ronald L. Mighell. John Wiley & Sons, Inc., New York. 187 pages. 1955. \$5.00.

THE first of the new Census Monograph Series presents a picture of American agriculture at midcentury. Tables, maps, and charts are helpful, and the language is clear and correct without being excessively technical. The book should prove to be a useful reference for agricultural economists generally, for rural sociologists, and for businessmen who have dealings with farm people.

Author Ronald L. Mighell of the United States Department of Agriculture has boiled down the tremendous mass of census data regarding agriculture. He has reorganized it along lines that conform to our economic discipline.

A special service has been done in differentiating commercial farms from small-scale, part-time, and residential farms. These are described separately.

Social features of the agricultural population such as race, age, education, health, and home improvements are described. In some instances, these data are compared over time. Useful comparisons with nonfarm data are included.

Mighell presents an interpretation as well as a factual treatment.

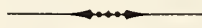
Theme of the book is this: An agricultural revolution is underway. New agricultural tech-

nology makes its advent in a sporadic manner and is not easily subjected to social control. Thus at times, such as the present, technology results in heavy supplies. Because of the inelasticity of demand, farm prices and farm incomes are reduced. Great stress thus is placed on our social institutions. Government, for good reasons, engages in agricultural research. Hence, to a degree, government is responsible for the heavy agricultural supplies and the resulting agricultural distress. Governmental actions should therefore be taken to facilitate the adjustments that are needed to accommodate the new technology.

This book is a cautious questioning of the widely accepted idea that agricultural research and technology are an undiluted benefit.

Mighell says . . . "the intent in this book is neither to forecast the future nor to propose courses of action." To this objective he generally adheres. But he evidently looks with approval on programs of education, programs to increase the mobility of farm people, and ". . . some method of income support during the transition period. . . ."

Don Paarlberg



STUDENTS who cut their statistical eyeteeth on the first edition of Mills' *Statistical Methods* will look with an expectant eye on the third edition. After a too long interval since the second (1938) edition, Professor Mills has added material to reflect some of the main currents of statistical developments of recent years.

Most of the original volume is retained in substance, some of it verbatim. But the revision involves both a thorough reworking of much of the earlier text and the addition of considerable new material, drawing upon both the recent literature and the author's own experience. The new material includes a more complete presentation of the developments of the Student-Fisher era, and of new techniques for analyzing economic and business statistics. Examples are used freely to help the student to bridge the gap between the textual discussion and his own world.

The references appended to each chapter and recapitulated in a complete bibliography at the end of the book provide a convenient lead for the pursuit of specific problems. They attest to the wide area over which Professor Mills has ranged in preparing this edition.

The appendices have been expanded by two valuable additions; and a section of statistical tables, which was completely lacking in the first edition and supplied to a limited extent in the second, now includes most of the tables that the average practicing statistician has occasion to use in normal day-to-day work.

Like its predecessors, the third edition presents in scholarly manner the major current techniques, with primary emphasis on the field of economic and business statistics; the approach is primarily descriptive and applied rather than theoretical; statistical theory is brought in—not beyond the elementary mathematical level—to the extent necessary to validate the techniques. The book will find wide use both as a reference work for the practicing statistician and as a text in standard elementary academic courses on statistical methods. However, it is not designed to take the place of theoretical works which are directed

specifically to the philosophy and mathematical foundations of statistics. The student who aspires to competency in his field will still need the broader and more intensive discipline of the foundations of statistics.

The first nine chapters present the basic tools for the statistical description of data in a thorough, detailed, and comprehensive way. Possibly the symbolism is more formidable and complicated than really is necessary. It seems to this reviewer, also, that the emphasis upon *description* of given observed distributions tends to obscure somewhat the fact that any sample is of interest only so far as it provides a basis for a valid inference concerning the population from which it came. Then one may well question, in view of the central place of sampling in modern statistics, whether the closing chapter is the most auspicious place to develop such an important subject. It might well be argued that the student should be carried through this subject immediately following probability and inference, and in a manner integrated or correlated with his introduction to inference and estimation.

If any sections should be singled out for special commendation, it would be those that deal with the problems of time series and index numbers of prices and production, which are areas of special interest to economic analysts. The chapter on cycles, particularly, represents a substantial advance over earlier editions, with special attention to the methods developed by the National Bureau of Economic Research. The treatment of index numbers of prices concentrates on the solid core of basic theory and concepts, and properly depends heavily upon the work of Fisher and Mitchell. The recent contributions of Mudgett, Frisch, and Ulmer, as well as others, are reflected in the reworking of this subject, and the new section, "Changes in Regimen and the Comparison of Price Levels," points out some of the real problems in this area and rounds out the theoretical treatment into a well-balanced whole. The chapter brings out the disadvantages of a distant base period, the essentially dynamic character of

the economy, and the futility of seeking in a base period a criterion of normalcy. In the shortened discussion of specific price indexes, only the Consumers' Price Index and the Parity Index are described in detail.

Multiple correlation is covered in considerable detail, including the relation between correlation and analysis of variance techniques. This reviewer wonders, however, why the more elegant methods of Waugh and Dwyer were not included as part of the correlation explanation. Most teachers will wonder also why the example used in the text was not set up in standard computation

form so as to illustrate the use of the check-sum technique in computing the product sums and in carrying through the Doolittle solution, instead of relegating the latter to the Appendix.

Although users will differ among themselves in their evaluation of particular sections, and may differ with the author concerning some details of the selection from recent literature, there will be virtual unanimity that in his third edition Professor Mills has presented a comprehensive and authoritative work which runs true to the form of its predecessors.

B. Ralph Stauber



A Statistical Study of Livestock Production and Marketing. By Clifford Hildreth and F. G. Jarrett. Cowles Commission for Research in Economics. Monograph 15. John Wiley and Sons, Inc., New York. 156 pages. 1955. \$4.50.

A MAJOR complaint on the part of applied econometricians and economists in general has been the paucity of empirical studies using the "modern" simultaneous-equations approach to the problems of supply-demand analysis. Hildreth and Jarrett in this, the latest of the Cowles Commission Monographs, use this approach and provide a welcome addition to the small but rapidly growing list of empirical studies in which this method of analysis is used.

In the preface the authors state that the basic reason for the study is methodological: "It was desired to try various methods, recent and traditional, of problem formulation and statistical analysis in an important and promising practical setting. Useful empirical results were sought, but the main emphasis was placed on the development, application, and testing of methods that might prove effective in analyzing interrelated segments of economic activity." The livestock complex was selected because of its importance, the availability of data, and previous studies in this sector.

The authors apparently recognize the fact that a major area of interest lies in comparison of results obtained by the limited-information technique with those obtained by the traditional single-equation multiple correlation technique. Least-squares counterparts of the limited-information estimates are presented in each case; and this book, in general, should do much to satisfy this interest. Defenders of both approaches, however, will be hard put to find a basis for deciding between them. The authors point out that, in many instances, there is little basis—either *a priori* or mathematical—for choosing between them. These results tend to bear out the position of many agricultural economists that the "traditional" approach to analysis of many agricultural commodities will yield valid estimates of coefficients with only a minor investment in computational time and effort. From most of the empirical studies to date, including this one, it appears that rather strong conceptual reasons should be present before the computations required to obtain limited-information estimates are undertaken.

Unlike many past monographs of this series there is relatively little that is new in the way of either economic or mathematical theory. Essentially, the authors have brought to bear existing economic theory and the latest in statistical techniques on an empirical study of the domestic livestock economy. As such, it should prove more interesting to applied economists and statisticians who are interested in methodology than to those concerned primarily with theory and new statistical techniques. Though the authors state that they "have tried to obtain quantitative approximations to some of the underlying relations determining quantity and price of livestock products produced in the United States each year," commodity specialists and government administrators concerned with the livestock economy will find little that will aid them in the course of their work. This stems largely from the level of aggregation on which the analysis is based, the form of the variables used, and the existence of substantial evidence that structural changes have occurred in the postwar period. The authors are fully aware of the limitations of aggregate studies and emphasize the need for construction of complete models for individual products.

The nature of the study and the number of alternative formulations presented preclude any simple summary of results; but estimates of such important coefficients as demand and income elasticity do not differ greatly from those obtained by other research workers. In every area, analysis is as complete as possible; results are checked for

both logical and mathematical consistency; and in many instances alternative formulations are given. The basic conclusion to be drawn from these results is that, if further advancement is to be made in our knowledge of the relations that exist in the livestock economy, equally intensive but less aggregative studies will need to be made. Aggregates tell us no more than averages, for they conceal as much as they disclose.

Readers who are familiar with the Cowles Commission's previous monographs may have some misgivings about attempting to read this report. It seems, however, that mathematical economists have at last come to realize the problems of communication between themselves and literary economists. Though the mathematics are still formidable in many places, a small investment in persistence and careful reading will prove rewarding. The book's organization and its careful description of variables, equations, and techniques used, do much to place the work in a readable category for the nonmathematician. It is particularly recommended to all who are concerned with quantifying economic relationships.

This study was carried out under a contract with the former Bureau of Agricultural Economics and was made under authority of the Agricultural Marketing Act of 1946 (RMA, Title II). The project was substantially completed in 1952, but pressure of other activities and a change in the residence of the authors delayed preparation of the manuscript for publication.

Kenneth W. Meinken



PROFESSOR Halcrow has performed a useful service for agricultural economists, especially for those who are unable to keep up with the current literature in their professional field. This includes most of us. Because of demands of specialized responsibilities, few manage to stay in close touch with all phases of farm economics. Satisfaction of the natural desire to keep informed is difficult in terms of reading time required and in view of the wide array of publications to which agricultural economists contribute.

The services Professor Halcrow provides include a discerning job of sifting materials published during the last 10 to 15 years and assembling in one inexpensive volume a well-rounded selection of significant writings. The selection will appeal to diligent readers of the *Journal of Farm Economics*, as well as to those who customarily read only an occasional article here and there. Of 41 items included, less than half appeared in the *Journal* and most of these are taken from Proceedings issues. The rest are articles assembled from eight other professional periodicals published in the United States and Canada, and relevant excerpts from a number of books and reports. Forty-eight individuals are represented, including such well-known contributors as J. S. Davis, Sherman Johnson, Earl O. Heady, Willard W. Cochrane, Frederick V. Waugh, Theodore W. Schultz, Karl Brandt, Leonard A. Salter, and Ernest T. Baughman, to name only a few.

In accordance with established custom, the editor candidly recognizes the vicissitudes of such

an anthological undertaking in the absence of accepted standards of selection. Although this humble explanation helps the reviewer to understand the nature of the editor's task, it does not persuade him to concur fully in the selection of materials. Regardless of differences of opinion as to what should have been included, the anthology achieves the objective of providing opportunity to obtain a concept of what's cooking in the general area of agricultural growth and development, and in the specialized fields of farm production economics, agricultural prices, marketing, price-income policy, land economics, and farm finance and employment. This opportunity is enhanced considerably by Professor Halcrow's introductory remarks for the book as a whole and for the sections devoted to each of these subjects. These provide excellent perspective by indicating the logic and the continuity that underlie the selections.

Emphasis throughout the book is on broad policy aspects of currently important problems, which are described, evaluated, and analyzed by authoritative authors, with little reliance on mathematical formulae or statistical tables. The usual pattern of treatment includes discussion that suggests remedial measures and consequences of different courses of action. Less germane parts of articles are omitted to conserve the reader's time. The result is worth the time of participants in all walks of agricultural economics.

Harry C. Trelogan



THE evolution of the contract marketing of butter and eggs in the United States is explained in Irwin's book. The need for, and provision of, an organized market came much later for butter and egg futures than for the nonperishables, such as grain and cotton; the author was thereby enabled to obtain much historical data and impressions first-hand from butter and egg traders still living who had helped to organize the first butter and egg exchanges.

Until the latter half of the Nineteenth Century, according to Irwin, butter and eggs were produced for immediate consumption. Preservation methods developed in that period permitted supplies to be carried forward from the spring period of flush production to the fall period of low production. Nonetheless, there was such severe uncertainty, regarding both quality and price, that the functions of storing, financing, risk-taking, and marketing could not be separated readily. Then too, the cost of storing was so great that only limited quantities could profitably be carried forward. These conditions served to concentrate control of storage in the hands of a few traders in the larger markets, primarily Chicago.

As the technology of preservation advanced to produce lower costs and fewer uncertainties as to quality, these dealers found it increasingly difficult to finance independently the purchase and long-term storage of large quantities. Lending

institutions were reluctant to make loans on commodity collateral because of the remaining uncertainties regarding price. This resulted in forward selling of stored commodities and in development of standard contracts for such sales. From this grew today's organized exchanges for the trading of futures contracts in butter and eggs.

Irwin's discussion of the ways in which organized trading in butter and egg futures facilitated the marketing of these commodities will be useful to persons interested in the role of commodity exchanges. His list includes (1) the transfer of price risks, (2) the financing of accumulations, (3) price determinations, (4) transfer of ownership, and (5) a continuous market. The author discusses some fundamental changes in the production of butter and eggs and in marketing conditions to which futures trading must adjust. For those who are interested, Appendix I provides a brief history of the evolution of futures trading in grain and cotton.

Several problems which now vex exchange officials, traders, and others are, in my opinion, dealt with too briefly. One of these is the entrance into the speculative arena of futures trading of many uninformed and poorly financed individuals, primarily on the buying side. Another is the withdrawal of a number of well-informed and well-financed traders from the futures market.

John O. Gerald



FUNCTIONALLY, the Food and Agriculture Organization of the United Nations (FAO) stands in the same relationship to the United Nations that the United States Department of Agriculture stands to our Federal Government. Structurally, this is not true; FAO is one of the specialized agencies of the United Nations, and these have their own member nations some of which are not even members of UN. Yet FAO's functions in the UN family of nations, which is a sort of loosely formed confederacy, are more than roughly parallel to those that the Department performs for our National Government and our people. *The Story of FAO* tells about the conception and birth of FAO and of its formation and achievements since it was organized 10 years ago this October.

One of the early chapters comes to the nub of the whole thesis and purpose of FAO when it describes the differences between a technologically advanced country like the United States and an underdeveloped country like Egypt. The author summarizes it in a personal note: "When I realize how wide is the gap between conditions today, and how things have changed, I cannot doubt the possibility of narrowing the gap between Abu Libda and Jim Barton." Earlier in the book the reader has been shown these two farmers and their farms to illustrate the difference between an underdeveloped and a developed technology. Abu Libda is a hard-pressed farmer in the Nile Valley, and Jim Barton a well-to-do farmer in Iowa.

In the formative period of the organization, Mr. Hambidge recounts, FAO was pressed to undertake international action that would have cut across national sovereignty. FAO rejected two such proposals. Each sought authority for an international body under FAO aegis to deal with food distribution. Sir John Boyd Orr, the first director general, initiated a plan for a World Food Board, an international body with power to buy, hold, and sell important agricultural commodities entering world trade, and to set maximum and minimum prices for these commodities in the international market. After Sir John's

plan was rejected, his successor, Norris E. Dodd, revived the idea in modified form as the International Commodity Clearing House, but this too proved to be unacceptable. By 1949, the year that the second proposal was disapproved, it became apparent that FAO's functions for the foreseeable future would be limited to advisory work.

More than a third of Mr. Hambidge's report pertains to projects in this area, largely technical assistance. Here we get a review of the technical cooperation—literally hundreds of helpful projects—that FAO has fostered through regional work and with individual countries in the Near East and Africa, the Far East, Latin America, and Europe. An appendix enriches the text with footnote material valuable for reference—the FAO constitution; national contributions to the UN technical assistance program; statistics on nutrition, infant mortality, land resources, percentage of working people who are farmers, by country; and much more. The appendix contains also the source material of the book, listing both FAO publications and other literature, and an index that is rich in detail.

Gove Hambidge, former editor of the *Yearbook of Agriculture*, is probably the foremost interpreter of the agricultural sciences in our language today. He has been with FAO since the original interim commission was organized at the Hot Springs conference in 1943. He has had a hand in shaping the organization's policies and has written many of its major publications. What he has given us in *The Story of FAO* is a fragment of his own life as he has lived it for FAO.

People are forever asking, What has FAO done? Why don't more people know about FAO? *The Story of FAO* gives a comprehensive answer to the first question; and its publication goes far toward providing an answer to the second. Here is a definitive account of the work of FAO, readable, factual, and accurate. It will be valued highly, especially by students of foreign affairs who are working in aspects of food and agriculture in the world economy.

Charles E. Rogers

The intention of this volume is to summarize the present state of knowledge and hypotheses concerning factors that affect population trends and the influence of these trends upon economic and

social conditions. It gives emphasis to findings of factual research, but as findings are limited in both quantity and scope, other writings, both inferential and hypothetical, are included.

Selected Recent Research Publications in Agricultural Economics Issued by the United States Department of Agriculture and Cooperatively by the State Colleges ¹

AGNEW, DONALD B., AND JACKSON, DONALD. STORAGE IN MARKETING FARMERS' STOCK PEANUTS. U. S. Dept. Agr. Mktg. Res. Rept. 88, 55 pp., illus. April 1955.

Better quality peanuts on the market and an annual saving of \$500,000 in marketing costs could be achieved through improved practices in storing and handling farmers' stock peanuts at plants of first buyers—shellers, crushers, and "other" dealers.

BAKER, RALPH L., AND MATZEN, EDWIN H. SAMPLING TO DETERMINE GRADES OF EGGS. Pa. Agr. Expt. Sta. Bull. 602, 32 pp., illus. August 1955.

To design sampling schemes for use in purchasing eggs by the case, it is necessary to know something about the sources of variation in value or yield of particular grades. The major sources of variation considered in this study were (1) within-the-case, (2) case-to-case, and (3) delivery-to-delivery.

BAUKNIGHT, L. M. DIVISION OF COSTS AND RETURNS UNDER DIFFERENT TENURE ARRANGEMENTS AND DIFFERENT PRICE AND PRODUCTIVITY LEVELS. S. C. Agr. Expt. Sta. Bull. 422, 27 pp. May 1955. (Southeast Regional Land Tenure Committee Pub. 16.) (ARS cooperating.)

Analyzes the effects of different productivity and price levels on total farm income and on the relative amounts accruing to the landlord and the labor force under two different tenure arrangements and on three sizes of farm, with and without the use of tractor power for land preparation.

BAUMANN, ROSS V., HEADY, EARL O., AND AANDAH, ANDREW R. COSTS AND RETURNS FOR SOIL-CONSERVING SYSTEMS OF FARMING ON IDA-MONONA SOILS IN IOWA. Iowa Agr. Expt. Sta. Res. Bull. 429, 32 pp., illus. June 1955.

Suggests ways for improving present systems of farming in the area and compares net farm income from present systems with net farm income from alternative systems.

BOUMA, JOHN C. METHODS OF INCREASING PRODUCTIVITY IN MODERN GROCERY WAREHOUSES. U. S. Dept. Agr. Mktg. Res. Rept. 94, 30 pp., illus. (RMA)

Through improved work methods, better utilization of equipment, and balanced work crews, man-hours required in the warehousing operation were reduced 13 percent in 6 modern one-floor wholesale grocery warehouses. Projected savings of an additional 8 percent, for a total saving of 21 percent, can be expected with new equipment.

BREIMYER, HAROLD F., AND KAUSE, CHARLOTTE A. CHARTING THE SEASONAL MARKET FOR MEAT ANIMALS. U. S. Dept. Agr. Agr. Handb. 83, 46 pp., illus. June 1955.

Describes the most common seasonal patterns in production, marketing, and prices for meat animals and for meat. Contains information on births, marketing, and slaughter; production, consumption, and prices of meat; reliability of seasonal indexes, and how seasonal indexes can be used.

FOSSUM, M. TRUMAN. COMMERCIAL FLORICULTURE. SIZE OF ESTABLISHMENT AND CROP SPECIALIZATION OF GROWERS. U. S. Dept. Agr. Mktg. Res. Rept. 97, 75 pp., illus. June 1955. (RMA)

In 1949 more than two-thirds of the wholesale value of floricultural crops grown and sold in the United States were accounted for by establishments with a volume of \$25,000 or more. About 86 percent of the production of these growers came from establishments specialized to the extent that 50 percent or more of the wholesale value was in one of the seven major groups of crops.

FOSSUM, M. TRUMAN. COMMERCIAL ORNAMENTAL HORTICULTURE. SIZE OF ESTABLISHMENT AND CROP SPECIALIZATION OF GROWERS. U. S. Dept. Agr. Mktg. Res. Rept. 96, 88 pp., illus. June 1955. (RMA)

Provides an analysis of the commercial ornamental horticultural industry, showing the sizes of establishments and the degree of specialization of companies.

¹Processed reports are indicated as such. All others are printed. State publications may be obtained from the issuing agencies of the respective States.

GOODSELL, WYLIE D., BROWN, W. HERBERT, FOWLER, HERBERT C., HOLE, ERLING, HURD, EDGAR B., VERMEER, JAMES, AND JENKINS, ISABEL. FARM COSTS AND RETURNS, 1954 (WITH COMPARISONS), COMMERCIAL FAMILY OPERATED FARMS, BY TYPE, AND LOCATION. U. S. Dept. Agr. Agr. Inform. Bull. 139, 45 pp., illus. June 1955.

Presents summary results of farm operations in 1954 for 21 important types of commercial family operated farms in major producing areas.

GREGORY, WADE F. ECONOMICS OF PASTURES IN FEEDING SYSTEMS FOR DAIRY COWS. Ala. Agr. Expt. Sta. Bull. 296, 29 pp., illus. June 1955.

Farmer interest in and need for information relative to the profitableness of different grazing and feeding systems led to this economic study of several important grazing crops and their use in milk production in the Piedmont area of Alabama. Costs of producing forages with recommended practices were estimated for five forages.

GUNN, THOMAS I., AND CARPENTER, KENDALL S. MERCHANDISING FRYERS IN SELF-SERVICE SUPERMARKETS. Cornell Univ. Agr. Expt. Sta. A. E. 992, 14 pp., illus.

Controlled experiments were conducted in four chain stores in central New York in 1954. A mass display featuring a "Boatload of Chicken" combined with window advertising was the most effective promotional practice tested. Sales from this display were 126 percent greater than those with the standard type of display.

HAMANN, JOHN A., AND WRIGHT, STUART E. SUMMARY OF STATE, COUNTY, AND CITY LAWS AND REGULATIONS FOR MARKETING POULTRY. U. S. Dept. Agr. AMS-47, 23 pp. June 1955.

HANSING, FRANK D., AND GIBSON, W. L., JR. BECOMING A FARM OWNER—IS IT MORE DIFFICULT TODAY? Va. Agr. Expt. Sta. Bull. 473, 34 pp. June 1955. (RMA)

Data were obtained from 160 farm owners in Culpeper and Orange counties, Va., to determine (1) how the initial capital investment in farms is acquired, (2) what the relation of the method used in acquiring the initial capital is to the future rate of capital accumulation, and (3) what effect size of the initial investment, size of farm, age and education of operator, and productivity of soil has upon the farmer's success in attaining full ownership.

HEADY, EARL O., OLSON, RUSSELL O., AND SCHOLL, J. M. ECONOMIC EFFICIENCY IN PASTURE PRODUCTION AND IMPROVEMENT IN SOUTHERN IOWA. Iowa Agr. Expt. Sta. Res. Bull. 419, 24 pp., illus.

Sets forth fundamental principles useful in answering questions of economy in pasture production; provides information on costs and returns for different systems of pasture improvement and relates these to situations farmers may be in with respect to limitations of capital; and analyzes the attitudes, viewpoints, and reasoning of farmers regarding pasture management.

HECHT, REUBEN W. LABOR USED FOR LIVESTOCK. U. S. Dept. Agr. Statis. Bull. 161, 22 pp., illus. May 1955.

In 1950, 61.7 man-hours were spent in work with milk cows for each \$100 worth of milk produced; 45 man-hours were spent on laying and replacement flocks per \$100 worth of eggs and chickens produced; 11.9 man-hours per \$100 of broiler production; 26.8 man-hours for sheep; 23.8 man-hours for turkeys; 15.9 man-hours for hogs; and 15.8 man-hours for beef cattle.

HOLE, ERLING, AND BONDURANT, JOHN H. TOBACCO-LIVESTOCK FARMING. BLUEGRASS AREA OF KENTUCKY, COSTS AND RETURNS, 1954. U. S. Dept. Agr. ARS-43-16, 6 pp., illus. June 1955. (Ky. Agr. Expt. Sta. cooperating.)

Net cash farm income on commercial family-operated tobacco-livestock farms in the Bluegrass area of Kentucky increased moderately from 1953 to 1954. Cash receipts increased 4 percent and cash expenditures were a record high in 1954.

HOWELL, L. D. PRICE RISKS FOR COTTON AND COTTON PRODUCTS AND MEANS OF REDUCING THEM. U. S. Dept. Agr. Tech. Bull. 1119, 110 pp., illus. July 1955.

Prices of raw cotton and of cotton yarns and fabrics fluctuate widely during relatively short periods. Holding these products until they are needed by consumers involves risks of losses from price declines and possibilities of gains from price advances. This bulletin shows nature and extent of risks from price changes and indicates ways of improving the marketing of cotton and cotton products by reducing or offsetting these risks.

HUTCHINS, WELLS A. THE NEVADA LAW OF WATER RIGHTS. State Engineer of Nevada, Carson City. 66 pp. 1955. (ARS cooperating.)

This statement of the Nevada law of water rights was prepared as part of the revision of "Selected Problems in the Law of Water Rights in the West," issued by the U. S. Department of Agriculture in 1942 as Misc. Pub. 418.

JOHNSON, HAROLD D., GERRITY, MARTIN V., AND GARVER, C. ELLIOTT. TRANSPORTATION TESTS OF FRESH MEAT AND PACKINGHOUSE PRODUCTS IN REFRIGERATOR CARS (AN INTERIM REPORT). U. S. Dept. Agr. AMS-17, 67 pp., illus. March 1955.

This report is based on one of a series of studies to determine more efficient and economical methods of protecting meat and packinghouse products while in transit. Six tests were made of railroad transportation refrigeration, involving 20 carloads and using various icing services in combination with precooling of the empty cars.

LIMMER, EZEKIEL. RAILROAD AND TRUCK RATES AND MOVEMENTS OF FRESH FRUITS AND VEGETABLES FROM FLORIDA. U. S. Dept. Agr. AMS-53, 25 pp. June 1955. (RMA)

In 1952, rail shipping costs for most fresh fruits and vegetables grown in Florida were generally higher to important eastern, southern, and midwestern markets than truck charges. However, truck charges were substantially higher than rail shipping costs to western markets.

MARKETING SERVICES COMPANY, DIVISION OF DUN & BRADSTREET, INC. OPINIONS AND PRACTICES OF MANUFACTURERS REGARDING FIBERS USED IN INSULATED WIRE AND CABLE. U. S. Dept. Agr. Mktg. Res. Rept. 85, 30 pp., illus. April 1955.

Consumption data show that cotton in 1952 accounted for about one-tenth of the material bought for covering and insulating electrical wires and cables. The larger share of consumption was made up of plastics, rubber, and paper in various forms.

MCNEELY, JOHN G., AND TURNER, GEORGE E. TEXAS LIVESTOCK AUCTION MARKETS. Texas Agr. Expt. Sta. Misc. Pub. 118, 32 pp., illus. December 1954. (RMA)

In 1953, 153 livestock auctions were operating in Texas, and most producers had a choice of 2 or more auctions at which to sell their livestock. Number of buyers ranged from 22 in the smallest auction to 88 in the largest. More than 20 percent of the auction volume was from producers with 24 head of cattle or less, and 40 to 50 percent came from producers with less than 50 head. Operating costs ranged from \$1.34 to \$1.89 per animal unit.

METZLER, WILLIAM H. UNEMPLOYMENT AND PARTIAL EMPLOYMENT OF HIRED FARM WORKERS IN COTTON AREAS. U. S. Dept. Agr. and U. S. Dept. Labor cooperating. 40 pp., illus. July 1955.

Compares results of studies of utilization of local off-farm supplies of agricultural labor in four areas, in Arkansas, Georgia, Louisiana, and New Mexico, and provides data as to the composition of local supplies of farm labor.

PETERS, C. W. COSTS OF HAULING FRESH FRUITS AND VEGETABLES IN THE HONOLULU MARKET. Hawaii Agr. Expt. Sta. Agr. Econ. Bull. 9, 16 pp. May 1955. (AMS cooperating.) (RMA)

Purpose of the study was to measure costs involved in delivering fresh produce from the wholesaler's establishment to the buyer's location and to learn the cost of moving fresh fruits and vegetables from the docks in Honolulu to the wholesaler's place of business.

POULTRY MARKETING TECHNICAL COMMITTEE FOR THE SOUTHERN REGION. FINANCING BROILER PRODUCTION BY BANKS AND PRODUCTION CREDIT ASSOCIATIONS IN THE SOUTH. Southern Cooperative Series Bull. 44, 39 pp. June 1955. (Agr. Expt. Stas. of Ala., Ark., Ga., La., Miss., N. C., S. C., Tenn., Tex., and Va., ARS, and AMS cooperating.) (RMA)

Of the amounts loaned by lending agencies to the broiler industry from 1948 through the spring of 1953, growers and dealers each received about one-third; hatcherymen, feed mill operators, processors, and others received the rest. Lending agencies supplied 12 to 14 percent of the capital used by growers, dealers, hatcherymen and feed mills, and 33 percent of that used by processors who borrowed from them.

PURCELL, MARGARET R. TRANSPORTATION OF FLORIDA FROZEN ORANGE JUICE CONCENTRATE. A CASE STUDY OF CARRIER COMPETITION INDUCED BY DYNAMIC INDUSTRY GROWTH. U. S. Dept. Agr. AMS-50, 83 pp., illus. May 1955. (Processed.) (RMA)

In 1945-46, 1 plant produced 226,000 gallons of frozen concentrate in Florida and used less than half of 1 percent of the State's orange crop. In 1952-53, 21 plants produced 46.5 million gallons and used 45 percent of the crop. As markets for the concentrate widened, shippers encouraged motor carriers to apply for operating authority, thus setting off a sharp competitive battle for traffic.

RAYMOND, ROBERT S., AND MANDELL, STUART L. WOOL GREASE: THE ECONOMICS OF RECOVERY AND UTILIZATION IN THE UNITED STATES. U. S. Dept. Agr. Mktg. Res. Rept. 89, 164 pp., illus. June 1955.

Describes and analyzes the marketing channels and functions as well as the structure and characteristics of the wool grease industry.

SCHMIDT, J. L. WHEAT STORAGE RESEARCH AT HUTCHINSON, KANS., AND JAMESTOWN, N. DAK. U. S. Dept. Agr. Tech. Bull. 1113, 98 pp., illus. June 1955.

Deals primarily with agricultural engineering phases of cooperative wheat storage research started in 1941 by the Department in cooperation with the Kansas and North Dakota Agricultural Experiment Stations. A section on management studies, which were a joint responsibility of engineers and entomologists, is included.

SITLER, HARRY G., AND REINBERG, REX D. NORTH-EASTERN COLORADO IRRIGATED PASTURES . . . COST AND PRODUCTION. Colo. Agr. & Mech. Coll. Bull. 437-A, 71 pp., illus. November 1954. (ARS cooperating.)

Production of milk credited to irrigated pasture was 3,150 pounds per acre for the 3 years of the study; the gain in liveweight was 462 pounds for beef-fattening cattle, 326 pounds for breeding cows and 216 pounds for sheep, per acre of pasture.

SOUTHEAST REGIONAL LAND TENURE COMMITTEE. FLORIDA CASH RENT FARM LEASE GUIDE. Fla. Agr. Expt. Sta. Cir. S-80, 10 pp. May 1955. (Regional Pub. No. 19) (Agr. Expt. Stas. of Fla., Ala., Ga., N. C., S. C., Tenn., and Va., the Southeast Regional Land Tenure Committee, the Agr. Res. Serv., and the Farm Foundation cooperating.) (RMA)

SOUTHEAST REGIONAL LAND TENURE COMMITTEE. FLORIDA FIELD LEASE GUIDE. Fla. Agr. Expt. Sta. Cir. S-79, 8 pp. May 1955. (Regional Pub. No. 18) (Agr. Expt. Stas. of Fla., Ala., Ga.,

N. C., S. C., Tenn., and Va., the Southeast Regional Land Tenure Committee, the Agr. Res. Serv., and the Farm Foundation cooperating.) (RMA)

SOUTHEAST REGIONAL LAND TENURE COMMITTEE. FLORIDA SHARECROPPING AGREEMENT GUIDE. Fla. Agr. Expt. Sta. Cir. S-82, 18 pp. May 1955. (Regional Pub. No. 21) (Agr. Expt. Stas. of Fla., Ala., Ga., N. C., S. C., Tenn., and Va., the Southeast Regional Land Tenure Committee, the Agr. Res. Serv., and the Farm Foundation cooperating.) (RMA)

SOUTHEAST REGIONAL LAND TENURE COMMITTEE. FLORIDA SHARE-TENANT LEASE GUIDE. Fla. Agr. Expt. Sta. Cir. S-81, 19 pp. May 1955. (Regional Pub. No. 20) (Agr. Expt. Stas. of Fla., Ala., Ga., N. C., S. C., Tenn., and Va., the Southeast Regional Land Tenure Committee, the Agr. Res. Serv., and the Farm Foundation cooperating.) (RMA)

TAYLOR, MARLOWE M. FARM CREDIT IN A SOUTHERN GREAT PLAINS DROUGHT AREA. A STUDY OF CIMARRON AND TEXAS COUNTIES, OKLAHOMA, 1950-54. U. S. Dept. Agr. ARS 43-12, 74 pp., illus. June 1955.

Raises and illustrates questions about the agricultural credit policies of private lenders and of government lending agencies under adverse conditions, of farm production and income. Although lending agencies can help farmers to continue operations despite unfavorable prices and weather, the primary responsibility rests with the farmers themselves. The report gives information regarding adjustments made by individual farmers during the current drought.

TEMPLE, FREDERICK C. COTTON AND COTTONSEED MARKETING AND RELATED PRODUCTION PRACTICES AMONG NEGRO FARMERS IN MISSISSIPPI RIVER DELTA AREA OF LOUISIANA. U. S. Dept. Agr. AMS-46, 49 pp., illus. May 1955. (Processed.) (RMA)

The average age of the 252 Negro farmers interviewed was 51 years and the years of schooling were $4\frac{1}{2}$. The average farmer operated a farm of 56 acres; he had raised cotton 24 years; and, in 1952, he planted 20 acres of cotton and produced 15 bales.

THOMPSON, JUDSON A. DURABILITY OF CELLOPHANE FOR PACKAGING RICE FOR CONSUMER TRADE. U. S. Dept. Agr. AMS-61, 19 pp., illus. Aug. 1955.

Careful selection of the most suitable kinds and weights of cellophane in which to package rice will result in less breakage in handling and display. Geographical location has a marked effect on package durability. A variety and weight of cellophane that is satisfactory in one part of the country, or for rice of a certain moisture content, may be unsatisfactory under other conditions.

UNITED STATES AGRICULTURAL MARKETING SERVICE. MARKETING SERVICE PROGRAMS CONDUCTED BY STATE DEPARTMENTS OF AGRICULTURE UNDER THE AGRICULTURAL MARKETING ACT OF 1946 IN COOPERATION WITH UNITED STATES DEPARTMENT OF AGRICULTURE, OCTOBER 1, 1953—SEPTEMBER 30, 1954. U. S. Dept. Agr., AMS-56, 81 pp. June 1955.

UNITED STATES AGRICULTURAL MARKETING SERVICE. REGULATIONS AFFECTING THE MOVEMENT AND MERCHANDISING OF MILK. A STUDY OF THE IMPACT OF SANITARY REQUIREMENTS, FEDERAL ORDERS, STATE MILK CONTROL LAWS, AND TRUCK LAWS ON PRICE, SUPPLY, AND CONSUMPTION. U. S. Dept. Agr. Mktg. Res. Rept. 98, 124 pp., illus. June 1955.

Moderate relaxation of restrictive regulations on marketing to permit freer movement of milk might reduce prices to a fourth of the producers by an average of 48 cents per hundred pounds of milk for fluid use. In some markets the declines might be from 75 cents to \$1 per hundred pounds but these declines would be offset to some extent by an expected increase of a quarter billion pounds in consumption of fluid milk.

UNITED STATES AGRICULTURAL MARKETING SERVICE. VEGETABLES FOR COMMERCIAL PROCESSING. USUAL PLANTING AND HARVESTING DATES AND PRINCIPAL PRODUCING COUNTIES, BY STATES. U. S. Dept. Agr. Agr. Handb. 85, 51 pp. June 1955.

Contains information by States and by areas within States on planting and harvesting dates and principal producing counties for 11 vegetables for commercial processing.

UNITED STATES AGRICULTURAL RESEARCH SERVICE. ANIMAL UNITS OF LIVESTOCK FED ANNUALLY, 1909 TO 1954. U. S. Dept. Agr. ARS 43-10, 18 pp. June 1955.

Brings to date the information on animal units reported in "Animal Units of Livestock Fed Annually, 1919-20 to 1948-49," issued by BAE in October 1949.

UNITED STATES AGRICULTURAL RESEARCH SERVICE. CHANGES IN FARM PRODUCTION AND EFFICIENCY. ANNUAL SUMMARY. U. S. Dept. Agr. ARS 43-15, 41 pp. June 1955.

Despite droughts and acreage allotment programs, output in 1954 equaled the record set in 1953. Farm output reached a record high for the Middle Atlantic, East North Central, and Pacific regions in 1954, and a near-record high for the other regions. Crop production per acre in 1954 was the fourth largest to date. From January 1, 1946, through January 1, 1955, numbers of tractors increased 85 percent, grain combines 130 percent, corn-pickers 225 percent, and pickup balers and field forage harvesters 700 percent.

WAUGH, FREDERICK V. GRAPHIC ANALYSIS IN ECONOMIC RESEARCH. U. S. Dept. Agr. Agr. Handb. 84, 63 pp., illus. June 1955.

Suggests that all economists and statisticians should be familiar with graphic analysis and should use it along with the new mathematical theories and the electronic computing machines. The report reviews some of the graphic tools that can be useful and gives examples covering a variety of analyses.

WHITTEN, MARION E., AND HOLADAY, CHARLES E. AN EVALUATION OF METHODS FOR DETERMINING THE LINTERS CONTENT OF COTTONSEED. U. S. Dept. Agr. AMS-51, 29 pp., illus. June 1955.

Provides basic information on the accuracy of available methods of analysis for linters content of cottonseed and develops a more accurate, more rapid, and more economical method of linters determination.

WILHELMY, ODIN, JR., AND BARR, HARRY W., JR. THE MARKET POTENTIAL FOR FATS AND OILS IN DRYING-OIL USES. U. S. Dept. Agr. Mktg. Res. Rept. 90, 126 pp., illus. April 1955.

Research on the basic chemistry of inedible fats and oils is necessary if increased quantities of these commodities are to be used in drying-oil products. Essential to effectiveness of this research is increased recognition by the farmer, the processor, and the consuming industries of the potential value of drying oils as basic chemical raw materials.

WILLIAMS, S. W., QUACKENBUSH, G. G., BARTLETT, R. W., BAUMER, E. F., AND COOK, H. L. INCREASING MILK CONSUMPTION IN SCHOOLS. Mich. Agr. Expt. Sta. Spec. Bull. 403 (North Central Reg. Pub. 60), 56 pp., illus. August 1955.

Reports the findings of an overall survey of school milk programs in the 12 North Central States and Kentucky, and of more intensive studies in Illinois, Michigan, Ohio, and Wisconsin.

WINSTON, J. R. THE COLORING OR DEGREENING OF MATURE CITRUS FRUITS WITH ETHYLENE. U. S. Dept. Agr. Cir. 961, 13 pp., illus. May 1955.

Some citrus fruits attain an acceptable taste and become legally mature before they develop the orange or yellow color associated with ripe citrus fruit. "Coloring" for citrus fruit is a chemical stimulation of the natural degreening processes. Ethylene gas hastens the natural breaking down of the green pigment in the peel and reveals the yellow or orange-yellow carotenoid pigments. Nothing has been found which degreens oranges more rapidly than ethylene alone.

WOOTEN, HUGH H. AGRICULTURAL LAND RESOURCES IN THE UNITED STATES. WITH SPECIAL REFERENCE TO PRESENT AND POTENTIAL CROPLAND AND PASTURE. U. S. Dept. Agr. Agr. Inform. Bull. 140, 107 pp., illus. June 1955.

Projection of the recent trend in development and conversion of land indicates that the total area of cropland may reach 508 million acres by 1975, an increase of 30 million acres over 1950. Total land available for pasture and grazing may possibly decline about 25 million acres. The total forest area may be maintained at about the present level.

WRIGHT, R. C., AND WHITEMAN, T. M. SOME CHANGES IN EASTERN APPLES DURING STORAGE. U. S. Dept. Agr. Tech. Bull. 1120. June 1955.

Yellow Newtown apples can be successfully stored for 6 months at 31° F. with an additional week at 70° for merchandising. Stayman and York Imperial can be kept up to 5 months at 31° with an additional week for merchandising. Delicious, Yellow Newtown, and York Imperial apples can be kept up to 7 months at 31° before becoming overripe.

Statistical Compilations

UNITED STATES AGRICULTURAL MARKETING SERVICE. COTTON AND COTTONSEED: ACREAGE, YIELD, PRODUCTION, DISPOSITION, PRICE, AND VALUE, BY STATES, 1866-1952. U. S. Dept. Agr. Statis. Bull. 164, 64 pp. June 1955.

UNITED STATES AGRICULTURAL MARKETING SERVICE. SWEETPOTATO PRICES. MONTHLY AND SEASON AVERAGE PRICES RECEIVED BY FARMERS, BY STATES AND UNITED STATES, 1909-53, REVISED ESTIMATES. U. S. Dept. Agr. Statis. Bull. 163, 32 pp. June 1955.

UNITED STATES DEPARTMENT OF AGRICULTURE. PACIFIC NORTHWEST WHEAT, BY VARIETIES, ACREAGE HARVESTED AND PRODUCTION, 1949 AND 1954, WASHINGTON-OREGON-NORTHERN IDAHO. (Pacific Northwest Crop Improvement Association, Oregon Wheat Commission, and Washington State Dept. Agr. cooperating.) 12 pp. June 1955.



AGRICULTURAL ECONOMICS
RESEARCH

Is published quarterly by the Agricultural Marketing Service, U. S. Department of Agriculture. The printing of this publication has been approved by the Director of the Bureau of the Budget, Feb. 9, 1955.

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 20 cents a single copy, 75 cents a year domestic, \$1 foreign.

7 Agr
cop 2

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Washington 25, D. C.

December 1955

INDEX, AGRICULTURAL ECONOMICS RESEARCH

VOLUME VII, 1955

	Page
Agricultural	
economics, contemporary readings in.....	116
production, the economic theory of.....	57
products, marketing bill.....	101
resources, world atlas.....	86
American agriculture, its structure and place in economy.....	112
Apples, measurement of retail sales.....	33
Australia, wartime agriculture.....	81
Big enterprise in a competitive system.....	54
Cattle cycle.....	1
Consumer	
expenditure and behavior, United Kingdom.....	23
survey of milk products, sampling aspects of a.....	50
Corn yields, validity of objective estimates.....	69
Cotton yields, objective forecasts.....	108
Demand	
analysis and research.....	23
for meat.....	73
Economic	
change in America.....	53
theory of agricultural production.....	57
Education	
adult, in rural social systems.....	55
agricultural freedom in.....	82
Exports, farm, postwar Government financing.....	91
Farm	
appraisal, principles of.....	25
book, Thomas Jefferson's.....	29
food products, labor costs of marketing.....	42
life, American.....	56-112
management	
advisory work, a handbook of standards and statistics for.....	84
analysis.....	24
principles of.....	24
products,	
marketing.....	78
short time price movements in.....	19
Food and agriculture in Britain, aspects of wartime control.....	81
Food and Agriculture Organization, story of.....	118
Futures trading, the evolution of.....	117
Germany, sampling in agricultural statistics.....	12

	Page
Jefferson, Thomas, farm book.....	29
Labor costs in marketing farm food products.....	42
Livestock production and marketing, a statistical study.....	114
Marketing	
bill for agricultural products.....	101
case studies and text.....	78
farm products.....	78
Measurement of retail sales of apples.....	33
Meat, demand for.....	73
New Zealand, wartime agriculture.....	81
Objective	
estimates of corn yield, validity of.....	69
forecasts of cotton yields.....	108
Population trends, the determinants and consequences of.....	119
Price movements, short-time, of farm products.....	19
Programing, alternative methods of.....	63
Refrigeration in America, history of.....	28
Research publications in agricultural economics.....	30, 58, 87, 119
Resources	
agricultural, world atlas.....	86
for the future, report of Mid-Century Conference.....	80
Rural social systems and adult education.....	55
Sampling	
errors, consumer milk survey.....	50
in West German agricultural statistics.....	12
methods and theory.....	27
Statistical methods.....	113
Survey methods, contributions to economics.....	83
Wartime	
agriculture in Australia and New Zealand.....	81
control of food and agriculture in Britain.....	81
Wheat, world economy of.....	26

AUTHORS

	Page
Bailey, Warren R.	
Book review: Farm Management Analysis, by Lawrence A. Bradford and Glenn L. Johnson.....	25
Book review: Principles of Farm Management, by H. C. M. Case and Paul E. Johnston.....	24
Baker, Gladys L.	
Book review: Food and Agriculture in Britain, 1939-45; Aspects of Wartime Control, by R. J. Hammond.....	82
Book review: Wartime Agriculture in Australia and New Zealand, 1939-50, by J. G. Crawford, C. E. Donald, C. P. Dowsett, D. B. Williams, and A. A. Ross.....	81

Barnes, Carleton P. Book review: Atlas of the World's Resources. Volume I: The Agricultural Resources of the World, by William Van Royen.....	86
Breimeyer, Harold F. Book review: The Demand for Meat, by Elmer Working.....	73
Observations on the Cattle Cycle.....	1
Burrows Glenn L. Book review: Sample Survey Methods and Theory, by Morris H. Hansen, William H. Hurwitz, and William G. Madow.....	27
Crosby, James F., Jr. Book review: The Farm as a Business: A Handbook of Standards and Statistics for Use in Farm Management Advisory Work, prepared by the Ministry of Agriculture & Fisheries	84
Gerald, John O. Book review: The Evolution of Futures Trading, by Harold S. Irwin	117
Gerra, Martin J. Book review: Contributions of Survey Methods to Economics, by George Katona, Lawrence R. Klein, John B. Lansing, and James N. Morgan; edited by Lawrence R. Klein.....	83
Hendricks, Walter A. A Foundation for Objective Forecasts of Cotton Yields, with Harold F. Huddleston.....	108
Validity of Objective Estimates of Corn Yield.....	69
Hixson, Eugene E. Sampling Aspects of a Consumer Survey of Mill Products.....	50
Houseman, Earl E. Measurement of Sales of Apples in Retail Stores..	33
Huddleston, Harold F. A Foundation for Objective Forecasts of Cotton Yields, with Walter A. Hendricks.....	108
Meinken, Kenneth W. Book review: A Statistical Study of Livestock Production and Marketing, by Clifford Hildreth and F. G. Jarrett.....	114
Book review: The World Wheat Economy, 1885-1939, by William Malenbaum.....	26
Mighell, Ronald L.: Alternative Methods of Programming.....	63
Ogren, Kenneth E. Labor in the Marketing of Farm Food Products, with Kathryn Parr...	42
The Marketing Bill for Agricultural Products.....	101
Paarlberg, Don. Book review: American Agriculture: Its Structure and Place in the Economy, by Ronald L. Mighell.....	112
Parr, Kathryn: Labor in the Marketing of Farm Food Products, with Kenneth E. Ogren.....	42
Polson, Robert A. Book review: Rural Social Systems and Adult Education, a committee report by Charles Loomis, Chairman; J. Allan Beegle, Editor; and others.....	55
Rafler, Doris Detre: Government Financing of Farm Exports in the Postwar Period.....	91
Raper, Arthur F. Book review: American Farm Life, by Lowry Nelson.	56
Rasmussen, Wayne D. Book review: Refrigeration in America: A History of a new Technology and Its Impact, by Oscar Edward Anderson, Jr.....	28
Book review: Thomas Jefferson's Farm Book with Commentary and Relevant Extracts from Other Writings, edited by Edwin Morris Betts	29
Reid, T. Roy. Book review: Freedom in Agricultural Education, by Charles M. Hardin.....	82
Rogers, Charles E. Book review: The Story of FAO, by Gove Hambidge	118

	Page
Scotfield, William H. Book review: Principles of Appraisal, by Giuseppe Medici.....	26
Scoville, Orlin J. Book review: The Economic Theory of Agricultural Production, by Lauri O. af Heurlin.....	57
Stauber, B. Ralph. Book review: Statistical Methods, (third edition), by Frederick C. Mills.....	113
Steele, Harry A. Book review: The Nation Looks at Its Resources. Report of the Mid-Century Conference on Resources for the Future	60
Strecker, Heinrich: Sampling in West German Official Agricultural Statistics.....	12
Trelogan, Harry C. Book review: Contemporary Readings in Agricultural Economics, by Harold G. Halcrow.....	116
Walsh, Robert W. Book review: Economic Change in America (Readings in the Economic History of the United States), edited by Joseph T. Lambie and Richard V. Clemence.....	53
Waugh, Frederick V. Book review: Big Enterprise in a Competitive System, by A. D. H. Kaplan.....	54
Book review: The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-38, by Richard Stone....	23
White, Bennett S., Jr. Book reviews: Marketing Farm Products, by Geoffrey S. Shepherd.....	78
Marketing of Agricultural Products, by Richard L. Kohls.....	78
Marketing of Agricultural Products, by Max E. Brunk and L. B. Darrah.....	78
Marketing Text and Cases, by Thomas Cannon and John A. Wichert	78

